TANDY LAPTOP COMPUTING JANUARY 1990 -VOL. 7, NO. 1

TERRY KEPNER'S

portable 100

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A MONTHLY PUBLICATION (EXCEPT COMBINED JULY/AUGUST ISSUE)

The Drug War

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Plus!

Road Warrior
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Inside the Tandy 600, Part II

74724 12

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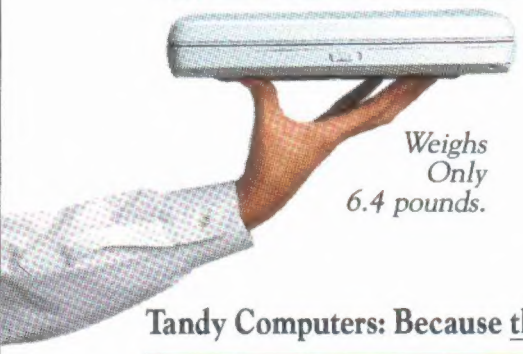

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Dimensions: 2.4 × 12.1 × 9.8″. MS-DOS licensed from Microsoft Corp.

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VOL. 7, NO. 1
January 1990

ON THE COVER:
This Peruvian drug policeman shows some of the weapons used in the war on drugs. Others are not so obvious , as you'll see in our cover story on page 8.

Photo by Boris Dreszhinski.

Tandy 102

THE FRONT LINES IN THE WAR ON DRUGS. 8
by Boris Dreszhinski
The Tandy 102 battles the White Horse.

THE ROAD WARRIOR MEETS THE ROAD WEARY 10
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A review of the CP+ Laptop Toolkit.

Tandy 200

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Put 1.4MB of data on a 720K disk!

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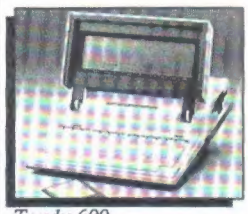
by Stevie A. Stark
A guide to the insides of the Tandy 600 and other computers!


Tandy 600

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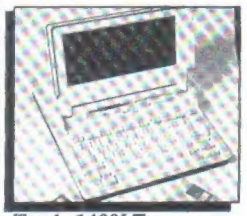
Tandy 1400LT

ROM WITH A VIEW

Recent worldwide political developments have made this an opportune time to discuss some of the major issues facing us in the coming decade. Of particular significance at the moment is the major issue of Total Word Count in ROM WITH A VIEW, which isn't very much. So, I'll do my usual thing here, and you can just discuss all that political stuff among yourselves, okay? Fine.

WP-2 Developments: Two companies have just released internal RAM expansion chips for the WP-2. Micro Mime (see their classified ad) offers a 32K chip, and Purple Computing (see their display ad) offers both 32K and—are you ready?—128K!

Tandy reports that the WP-2's tendency to lose characters in *TELCOM* occurs with some computers and database services, but not with others, and the cause is still unknown. When they learn more, they'll tell us, and we'll tell you.

Hot tip: Want to use several ROM's but hate swapping them in and out of your computer manually? American Cryptronics tells me they still have about 30 of the 6-ROM bank devices they formerly sold through PCSG. To get one, call American Cryptronics at (714)540-1174.

1400 Winks: To conserve battery power, Tandy 1400's "go to sleep" when there's been no keyboard activity for a user-specified period of time. Unfortunately, it also shuts off any ongoing telecommunications—not a fun thing to discover during a long, expensive download. Solutions are to (1) set the automatic time-out for the maximum (3 hours, 59 minutes) when doing any telcom, or (2) use *NODOZ.SYS*, a Tandy program installed via your *CONFIG.SYS* file, that completely disables automatic time-out. It's available free from your local Radio Shack. If they can't find it, have them check with their local support center. If necessary, work your way up the Tandy chain of command. It DOES exist, and you CAN get it!

New addresses: Cryptek has a new address: 633 Post St., Suite 193. We just received Bob Scott's review of Cryptek's *LILITH* data encryption software for Tandy (and other) computers. Watch for it soon.

December's SPC "Export Series" hard drive review listed an old address for SPC. The new address is 7950 Silverton Ave., #107, San Diego, CA 92126. In addition, they have a toll-free telephone number: (800)345-0824.

Correction: November's ad for the *FAST* cassette utility from Mel Zwillenberg listed the wrong price. The correct price, $19.95, appeared in the *FAST* review in that same issue, and in the December ad.

Shameless plug #1: Our new article index covers all *Portable 100* articles from September '83 through the Summer '89 issue. Those having the old index can order just the update for $4.00. See our back issue ad for details.

Shameless plug #2: We found some ultra-thin gender changers, so tiny they're ideal for our small computers. We liked them so well we decided to sell them ourselves! We're sure you'll like 'em, too. See our ad on page 9.

Welcome aboard: To Chris Courson, a heck of a nice guy who has volunteered handle the sysop chores for our *Portable BBS*. That means the *PBBS* will finally receive more of the attention it deserves. Thanks, Chris!

CQ All Hams: How many of you are amateur radio operators or shortwave listeners? I may be able to arrange some nice surprises for you. So send me your name, address, call, class of license, and main areas of amateur radio interest.

Well, according to the Official ROM WITH A VIEW Word Counter, I'm just barely gonna make it. Take care, and we'll see you all nex **[RWAV Capacity exceeded—Tough cookies, Nuge!]**

Toolbox

Manuscripts were typed into Microsoft Word 3.0 on a Tandy 1400 HD, where they were edited, spell-checked, and had basic format instructions inserted. From there they were loaded into a Tandy 4000 (80386 CPU, Tandy EGA Monitor, Tandy LP-1000 LaserPrinter) desktop computer and placed into Aldus' IBM PageMaker 3.01 Once there, design decisions on photo, figure, and listing sizes and placements were made. Here, pull quotes are placed, headlines, intros, and bylines are sized and positioned, and advertisements positioned.

Normally, the Tandy LP-1000 is capable of emulating only a Hewlett Packard Laser Printer Plus. But with the addition of the Destiny Technology Corporation (300 Montague Expressway, Suite 150, Milpitas, CA 95035. (408) 262-9400) PageStyler 4.5MB kit, the LP-1000 is turned into a fully-compatible PostScript printer, with all 35native fonts that are found in the Apple LaserWriter Plus printer. The Destiny PageStyler is available through the Tandy ExpressHardway system.

Page previews were output from the Laserprinter. When everyone was satisfied with the appearance, final pages were output and artwork and lineart ads were positioned. The finished magazine was then delivered to the printer, who printed it, labeled it, and mailed it to you.

TERRY KEPNER'S **portable 100**

PRESIDENT/PUBLISHER
Terry Kepner

EDITOR-IN-CHIEF
Terry Kepner

FEATURES EDITOR
David Klein

TECHNICAL EDITOR
Mike Nugent

NEW PRODUCTS EDITOR
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CONTRIBUTING EDITORS
Paul Globman
Thomas L. Quindry
Michael Daigle
Bill Brandon

CIRCULATION MANAGER
Bob Liddil

ADVERTISING DIRECTOR
Penny Brooks

Portable Computing International Corporation
145 Grove St. Ext., #21, PO Box 428
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CRDFIL KUDOS

As a result of the *CRDFIL.ROM* review in the October issue, I ordered the product. I agree with the reviewer—it's an excellent product, does the job, and has a fine manual. All at a reasonable price.

Wait—it gets better. In the order, I stated that I wanted the product to work with the Disk/Video Interface (D/VI) as well as portably on the Model 100, since I use the D/VI only at home.

Tony Anderson (*CRDFIL*'s author) called me and after discussion, sent me a cassette with essential parts of the display program for trial. I tried it, reported the results, he corrected it and sent me a second cassette for trial. It worked perfectly, so he promptly sent a D/VI version of the product that works with either the D/VI or the M100 display.

I am very well pleased with the product, the knowledge, service and courtesy shown by Tony Anderson.

Now, if we could just get the big-time software producers to show a similar interest in the customer's needs—wouldn't that be great?

Lee E. Warren
Sun City, AZ

GIMME MORE!

I loved your article, "Z88 to Model 100" in the April issue. I have been considering upgrading to a notebook computer with more features for some time. The key words in that last sentence are "notebook" and "more."

I do not want a "Laptop!!" I do not want a built-in disk drive. I do not want any feature that cuts my power down to a few hours. I want more when I upgrade, not less.

I want a larger screen, but I won't give up readability to get it. I want a spelling checker, but I won't add one or two pounds to my portable, or be satisfied with fewer than 80,000 words.

In short, I won't give up anything! If I can't keep the features that attracted me to the Tandy 102 in the first place, then more is less. I want the ease of use. I want the feel of the keyboard. I want the relatively long battery life.

If a new computer can meet these high standards and add enough additional features to make it truly *more*, then I'll consider it.

My point to *Portable 100* is this: Keep your focus on notebook computers. If Tandy will not make newer notebooks, then reach out to advertisers who will. I'd like to hear more about the Z88. I'd like a critical review of Atari's Portfolio. Expand. Give us more!

Robert Titus
Des Moines, IA

1100 FD LOOKS PROMISING

I'm sure you know of the Tandy 1100 FD coming out. I look forward to your first review. From what I'm told it's going to be a beaut. The local Tandy Computer Center people found out about it via the *Wall Street Journal*. They showed me the ad.

I still plan on keeping the 200, it's too user-friendly.

To me, it's the logical successor to the Tandy 200 (I still plan on keeping the 200, it's too user-friendly). With the MS-DOS and *DeskMate* software in ROM, the 1100 FD will give me what I want. I've always liked the operating system on the T200, what with the menu and all. DOS machines could never do that—until the 1100, that is.

Macintosh's menu is a lot better, but you couldn't, and still can't, get it in an affordable portable, unless you're D. Trump or have a hefty expense account. I'd consider the 1400 LT, FD or HD, but they are heavy and don't have *DeskMate*. I like the idea of hooking up a CM-5 monitor to the 1400, which is something I wish the 1100 FD could do.

With all the changes going on with Tandy portables, it will be interesting to see which direction *Portable 100* will take. You could stay the course, could embrace MS-DOS all the way, or compromise.

I enjoyed the *CRDFIL.ROM* review. I want to add a ROM to my T200 and am torn between the *Ultimate ROM II* and *CRDFIL*. But one of them will prevail.

Would it be possible to include user group or club news in *Portable 100*? I enjoyed the tidbit by Ed Juge in last month's ROM WITH A VIEW.

Keep up the good work.

Jurgan Almlie
Baldwinsville, NY

As our banner says, Portable 100 *is about "Tandy Laptop Computing," and since most of you own Model 100/102 and 200 machines, that continues to be our primary emphasis. As the user base of other Tandy machines grows, we'll expand their coverage accordingly. Increased MS-DOS advertising should help us add pages to cover them without decreasing coverage of the Model 100 family. And yes, we'll review the 1100 FD as soon as Tandy sends a review unit.*

ExtRAM from EME Systems (see their ad) can help to solve your Tandy 200 ROM dilemma, letting you load and save ROM images to disk, tape, or other devices, so you can swap ROM's in and out as needed.

There's also the multi-ROM bank from American Cryptronics (formerly distributed by PCSG). Though no longer advertised, ACI still has a few units left. Give them a call (see their ad for the phone number), but hurry!

The Ultra Card RAM expansion from Ultrasoft Innovations will incorporate a ROM eliminator, letting you store ROM images on a card, so you can switch ROM's at will.

I thought the Tandy User Group Newsletter *excerpt in our October issue would be of particular interest to readers, but we haven't enough space to run club and user group news regularly. For questions and suggestions about Tandy's newsletter, con-*

tact Ed Juge, Director of Market Planning, Radio Shack, 1700 One Tandy Center, Fort Worth, TX 76102.

-MN

ON THE MARK

My compliments on printing the opinions expressed by writer Michael Daigle in his piece, "Of Magic Words and Little Boxes" (THE IDEA BOX, October '89). He is very much on the mark.

As a sometime writer (and one-time contributor to *Portable 100*), I have at my disposal a sophisticated, dedicated, industrial-strength CPT word processor, and a megabyte-RAM Atari ST. It is one of my two Model 100's, however, that is best for creative writing, or the quick capture of fleeting thoughts and ideas.

May they always keep working!

Mark E. Ingram
Purdy, MO

ARTICLE SUGGESTION

Several electronic calipers on the market feature an RS-232 serial output. I would like to see an article on using the Model 200 or 1400 LT to process the data from these calipers in quality control applications.

I would like to feed the output of my Mitutoyo and Fowler Sylvac electronic calipers into my Model 200 or 1400 LT and have the computer print out a list of dimensions that are out of tolerance.

As parts are measured, the actual dimension should be shown on the computer screen. When a part is out of tolerance, the computer should beep, and an asterisk should appear next to the dimension. Finding those dimensions with an asterisk would give a list of the out-of-tolerance parts.

Robert Vincent
Rego Park, NY

Here's hoping your letter inspires one of our genius readers to write and submit just such an article.

-MN

ROM ADAPTER CLARIFICATION

Regarding the review "ROMBO: A D-I-Y Option ROM Adapter" (October '89), perhaps I can be of help in clarifying the differences between the different option ROM adapters. As you know, we [King Computer Services, Inc.] have done a tremendous amount of option ROM development, and we have a large number of clients using the various types of adapters. This is some of the feedback we have from them.

ROMBO—This semi-flexible board adapter used with a plastic spacer is preferred by those who do not want to be bothered with soldering. The modified version we provide with a Molex carriage is preferred by some of our customers, because they find that for mass production it is easier to line up the adapter and EPROM with the Molex. There is no taping involved, and it has a more professional look for resale.

Precision board adapters—These are the traditional circuit boards that require soldering. These are usually preferred by professional developers who want the solidity and permanence a soldered joint gives, and who want to avoid the possible failure caused by a curious user prying the unit apart, or an unethical user dismounting the unit and copying the code (at least with a soldered joint, it is more of a deterrent). Our boards are manufactured to precise specifications and are very reliable.

Socketed adapter—We also provide a version of the board with sockets soldered to it so that the EPROM can just be plugged in without soldering, and unplugged for erasing. This is in great demand by developers who like the ease of use. No fiddling with soldering or tape!

I also noticed mention of the GTEK EPROM Emulator. This emulator costs around $500. If anyone is interested, we sell an EPROM emulator for $250.

I hope this helps.

Helen Budlong
King Computer Services, Inc.
Los Angeles, CA

HELPING HAND

Attached is my letter alerting Merritt Computer Products, Inc., that I am praising their Safeskin membrane keyboard protector in a future issue of *Portable 100*, hopefully. This product is a keyboard protection item, a thin polyvinyl polymer membrane that covers the entire top of the Model 100 (or 102, 200, 600, or 1400). Unlike its competition, Safeskin is the only product that does not need to be raised or removed so that the keyboard can be used. The price is quite reasonable for such a quality product.

I hope that I have been able to broaden your advertising base ever so slightly by my actions.

Harry E. Griffith
Houston, TX

Nice of you to look out for us and your fellow readers like that! We've contacted Merritt on several occasions, most recently in regard to your letter. I'm afraid they're not convinced that there's a big enough market here to advertise.

Frankly, Harry, I don't see how they could pick a more targeted market of Tandy laptop users eager to hear of their products, but how do we convince them—maybe more letters like yours? Why not? Interested readers can write to Merritt Computer Products, Inc., 5565 Red Bird Center Drive, Suite 150, Dallas, TX 75234. Telephone (214)339-0753, in Canada (800)663-1061. Be sure to tell Rich Liebman we sent you!

-MN

BEST OF? YES!

In the Summer '89 issue you asked if anyone would be interested in a disk(s) of "The Best of ..." Answer: Yes. In particular, programs and articles for the Tandy 200.

Thanks very much for your time, and I'm looking forward to seeing what you can do about this great idea.

Ronald K. Caldwell
APO New York, NY

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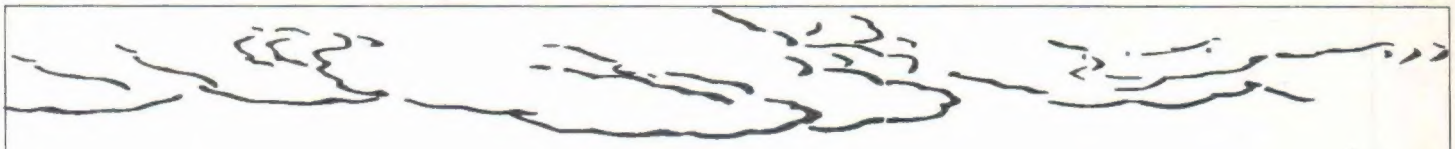

The Peasants Are Revolting
(And You Don't Look So Good Yourself)

Hi gang. Ever notice that the people who run computer companies seem to know less about computers than you do? Yeah, me too. Well, we're going to do something about it. First, though, let's take a look at what's happening in the marketplace.

In the last few months, several new notebook and handheld computers have burst forth onto the scene, as if the thought that people might actually like to buy inexpensive, lightweight computers was a new principle of physics that had just now been discovered. Among the companies lining up to cash in on this momentous revelation, we find (surprise) Tandy!

Not long ago, Mike Nugent reviewed the new WP-2, and I know others are taking a long look at the new 1100 FD, so I'm not going to duplicate their efforts here. Instead, I'd like to use these two machines to illustrate a point. With that in mind, here's a quick and very biased look at these two new entries.

TANDY WP-2

This is a small, dedicated word processor with some very impressive statistics. Like the Model 100, it runs on four AA batteries. It weighs a mere 3 pounds, it's only 1 inch high, 12 inches wide, and just 8 1/2 inches deep. It features an 80-column display, a word processor with a 100,000-word spell checker and a remarkable 200,000-word thesaurus; appointment and phone number functions; and even a terminal program, all built into ROM. The keyboard feels very good, the WP-2 is sexy looking, and the price is fantastic: just $349.00 ($299.00 on sale)! Sounds perfect, right? Well...

I had a chance to use one for a couple of weeks. When I first saw it, I almost started drooling. On the surface, it seemed like a writer's dream come true. My opinion quickly changed.

The keyboard, which felt great, proved to be as responsive to the touch as Reagan was to the homeless. I frequently looked up from the keyboard to see that I had typed a sentence that *loked lik ths*—when I could see the display at all. I don't know who at Tandy decided that dark blue letters against a dark green background was the way to go, but I suspect that he owns stock in a seeing-eye dog business. Tandy should give away a coal miner's hat with every unit sold. Hard to read? Was Orson Welles chubby?

There's more. There's no modem built in—just a terminal program to support a modem if you want to plug one into the serial port. Fine. The program can transfer a document between the WP-2 and another computer through direct-connect cables. But... to reliably transfer a document, you must first convert it into ASCII. The WP-2 will do this for you. Of course, when you convert it, you lose all formatting information. Unfortunately, because of the convoluted logic behind the WP-2 way of doing things, it's all too easy to make the ASCII conversion permanent. If the format is important to you, be *very* careful when transferring files.

Another problem is speed. As in Serious Lack Thereof. The WP-2 is... well... a toad. If you're in the middle of a paragraph and you want to insert a few words, do it slowly and carefully. One. Letter. At. A. Time. You can almost hear the WP-2 grinding its little gears as it moves all the other letters over to make room.

I'm probably being overly critical. After all, the unit doesn't cost that much for what it does, and it's going to be popular with a lot of people. Still, as a writer, I can't help but regret that something that had the potential to be so significant just fell short of the mark. Moving along...

TANDY 1100 FD

In advertising this new IBM-compatible laptop, Tandy's flyer describes it as "unique," and I've got to go along with that. The attractive lift-lid laptop has both MS-DOS *and* the popular *DeskMate* graphical user interface built into ROM. As part of *DeskMate*, a simple text editor with a 90,000-word spell checker (10,000 words less than the diminutive WP-2) are always available at power-up, without having to stop and load anything in from the built-in, 3.5-inch disk drive. I can't help but mention that the flyer goes on to add that "you can take notes without having to insert a diskette." True. Of course, when you power down, everything in RAM is lost. In other words, you can *create* notes without a diskette—you just can't *save* those notes without a diskette. And by the way, it's 1990—can we stop calling them disk*ettes*? What is that, a female disk from France? Am I picking nits here?

There are other examples of "flyer-speak" as well. "It is the size of a notebook..." OK, how many of you walk around with 7-pound notebooks? Sorry Tandy. The Model 100 is the size of a notebook. The 1100 FD is the size of every other low-end laptop on the market. "If you're on the move, it's the one to go with." Hey, Tandy, I've looked all over your new computer and guess what—there's NO HANDLE!

In all fairness, the 1100 FD represents an excellent value. At a list price of $999.00, this machine breaks new ground in the price/performance arena. It's attractive and well laid out. Some features, like the ability to use an internal 2400-baud modem and the availability of extra rechargeable battery packs make the 1100 FD a computer capable of kicking some serious silicon out there in the laptop wars. And yet...

The large 80x25 LCD display is the *same* nasty combination of midnight blue letters on a dark green background the WP-2 word processor uses; to make matters worse, the keyboard is the worst I've typed on since the Atari 520ST. The stubby little keys have hardly any travel,

BACK ISSUES—*New* Article Index!

With over 60 issues, and hundreds of articles, *Portable 100* is THE source for information, programs, and applications for your Tandy Portable Computer. But how do you find what you need among all those issues? The answer is the **newly updated** *Portable 100 Article Index*. Covering every issue from September 1983 to the combined summer 1989 issue, the index is designed to make it simple for you to find what you need. And at a cost of only $9.00 (postage and handling included), you should buy one today! If you have last year's index, don't despair. Update your index by adding our special 1988-1989 Update Index. It's a bargain at just $4 (P&H included).

And what do you do when you find an article you want? Easy. First check the back issue chart below for back issue availability. If the issue is available, just order it using the handy order form ($5.00 each, postage and handling included). If it isn't, don't despair. Photocopies of any article cost just $1.75 each. Simply list the article, or articles, by title, author, and issue, enclose payment, and in just a short time you'll have the articles in hand.

Month	83	84	85	86	87	88	89
January			Not Published				
February							
March			OUT		Not Published		
April		OUT					
May		OUT				OUT	
June		OUT					
July		OUT		OUT		combined July/August	combined July/August & Sept. (Summer 1989)
August							
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making you feel like you're using a giant calculator instead of a computer. Typing on the 1100 FD is like tickling the dead.

Now, I know nobody's perfect. Mistakes happen. Things get overlooked. But you can't use a computer without looking at the screen or typing on the keyboard. Somebody should have noticed. *Somebody* somewhere along the design line should have shouted, "The Emperor has no clothes!" or at least whispered, "The Emperor has clothes on, but they're *goofy!*"

Anyway, all this brings me to my point: Computer companies try to design computers based on what the consumer wants to buy. But how do *they* know what we want to buy? Do they ever ask us? Most of you out there probably sent in your registration cards when you bought your notebook computer. Tandy knows who you are. Tandy knows you buy computers. Did Tandy ever send you a questionnaire asking you what you'd like to see in the next computers they build (or buy from other manufacturers, as in the case of the Model 100, WP-2, and others)? No? Hmmmmm...

Well, this time we're not just going to sit back and wait for Tandy to barf up some half-baked next generation notebook computer. No sir. We're gonna design our *own* half-baked next generation notebook computer. And you're going to help.

I want you to think about what you'd like to see on the "Model 300," our hypothetical design exercise. If you could help create the successor to the Model 100/102 line, what would it be like? I'm not talking about "pie in the sky" features here (2-inch optical drives, 10 megs of RAM, laser cannons...); what I want are ideas that could be realistically (no pun intended) incorporated into a notebook computer that could retail for, say, under $600.00.

The Model 100 is already a great platform to build on. Of all the computers manufactured during the 80's, how many had the lifespan that the Tandy 100/102 series has? In its own quiet way, the 100 is quite a success story. Yet, sadly, we see aftermarket suppliers disappearing faster than farmers and housewives at an alien abduction convention. When that happens, my friends, the end of the road is in sight. Despite the recent appearance of some welcome new faces in the 100 world, we have to face the fact that Tandy won't sell this wonderful machine forever.

All good things must come to an end. But the Model 100 concept is just too good to let it die without a fight. I want Tandy to create a Model 100 for the 1990's. I want it to be so good that Tandy sells a ton of them, creating a whole new generation of Traveling Softwares and Portable Computer Support Groups. And, unlike the WP-2 and the 1100 FD, I don't want to see Tandy blow it.

So think about what you'd like to see and send me your ideas. In a future column, I'll put together a profile of the Model 300 based on what I feel are the best suggestions you have to offer. Then I'll fax a copy of the column right into the office of the CEO of Tandy, Inc.

The deadline for submitting your ideas is April 15, 1989. Send them to: Michael Daigle, 2125 North Farragut, Portland, OR 97217. Be sure to include your name so I can credit the really good ideas in the column.

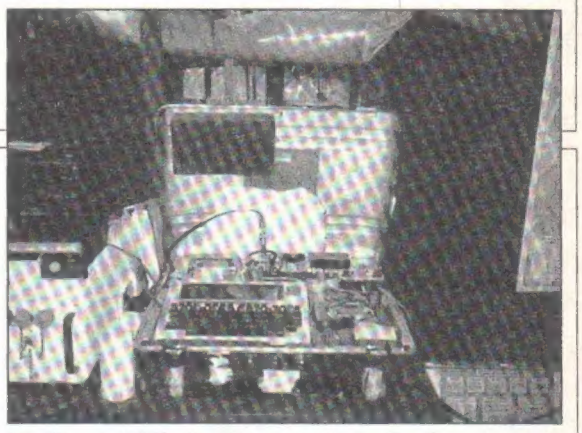
Now is the time for all good people to come to the aid of their computers. Take a hand in designing the next Model 100 now. Or you may find yourself typing blue letters on a green background later.

by Michael Daigle

The Front Lines in the War on Drugs

What's a nice, simple portable doing in a place like this?

by Boris Dreszhinski



The "low-tech" Tandy 102 rests inside its aluminum case ready to transfer high-tech messages between Peru and drug officials in Washington.

The call came at eleven o'clock on a Sunday night.

"Do you still want to go to the drug base?"

It was the Ministry's spokesman on the other end of the line.

"Of course," I replied.

"Very well, then. Your trip has been set up for some time this week—good luck!"

I unpacked my bags, chuckling at my triumph over the embassy bureaucrats. I'd spent ten days in a fleabag hotel, waiting for that call. If the Ministry's man had waited until Monday to call me, I'd have been gone.

The Drug Enforcement Administration (DEA) and the State Department have an ingrained fear of the press and had stalled, trying to wait me out, hoping I would tire of their games and go home.

But it was not to be. The 11 P.M. phone call had changed all that. Finally, I would get a chance to see what action our government was taking in President Bush's declared war on drugs. I was elated.

THE BATTLEFIELD

The Upper Huallaga Valley, a densely vegetated, triple-canopy jungle in central Peru, produces sixty-five percent of the world's coca leaf, the raw material from which cocaine is manufactured. The Upper Huallaga is essential to the dopers, for without its vast tonnage of coca leaf, the illegal cocaine trade would be severely reduced.

Almost eighty percent of Peru's countryside is under emergency law, since the Maoist guerrilla group *Sendero Luminoso* (Shining Path) has gone on a rampage in hopes of stopping municipal elections scheduled for late November. The Senderos have been taking over small towns and eliminating the political infrastructure by placing two well-aimed shots into the foreheads of local mayors. Peru certainly is an interesting place.

Santa Lucia, not even a small dot on most maps of the area, lies astride the Huallaga River, one of the main arteries for coca paste. Traveling north on the Huallaga, boats reach Iquitos, where the Huallaga flows into the Amazon. Further north and east, the Amazon courses through the "White Triangle" where Brazil, Peru, and Colombia meet. The area is called the White Triangle because an estimated eighty percent of the world's coca, either refined or as coca base, is smuggled through here.

The drug base at Santa Lucia is not a vacation spot one would write home about. Located some nine degrees below the Equator—which should tell you something about the heat and humidity—the base was set up last year by ex-Green Berets as an interdiction spot along the river. The State Department oversees the project with narcotics assistance officers.

Peruvian police show off several pounds of recently captured "pasta basica" (cocaine base, or coca paste). Cocaine in this form is smokable.

When we first arrived, DEA and State Department agents avoided us the way cokeheads avoid a windy day. The Peruvian drug police, however, asked us over to their building and showed us four kilos (about 8.8 pounds) of coca base they had captured only hours before. Four sullen young men, the alleged traffickers, were being questioned. They didn't appear too happy.

AN OLD FRIEND UNCOVERED

It rains a lot in the Upper Huallaga. Some even say it rains twenty-five hours a day. This rain was to bring me good luck and cause me to run into an old friend.

I was standing outside an army-type tent when the skies opened. I threw my jacket over my bag to protect my camera when a voice yelled from inside the tent.

"Don't you have enough sense to get in out of the rain? Get in here!"

Running toward the door, I noticed a small "dish" antenna mounted atop one corner of the tent. No electronics whiz myself, I figured it must be for satellite TV. Inside the tent, eight DEA agents

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readied their gear—Colt light machine guns, M-79 grenade launchers, C-4 high explosives, hand grenades, M-16 automatic rifles—for a raid on a drug lab. Over in one corner, sitting on a table, I spied a large, open aluminum suitcase, and next to that, some electronic gear and a small printer.

What really caught my attention, though, was my old friend, the Tandy 102 computer, mounted inside the suitcase. What was a lowly little 102 doing out here in the middle of some of the heaviest jungle in the world? I had to find out.

None of the DEA agents would answer my pleas to explain the Model 102's purpose. But the rain intervened again, and a non-DEA type ran into the tent to escape the rain. I laid it on him.

"Oh yeah," he said. "This is a satellite communications system, sophisticated and at the same time simple."

"Why the Tandy 102?" I asked. "Surely you can get far more powerful computers for this job."

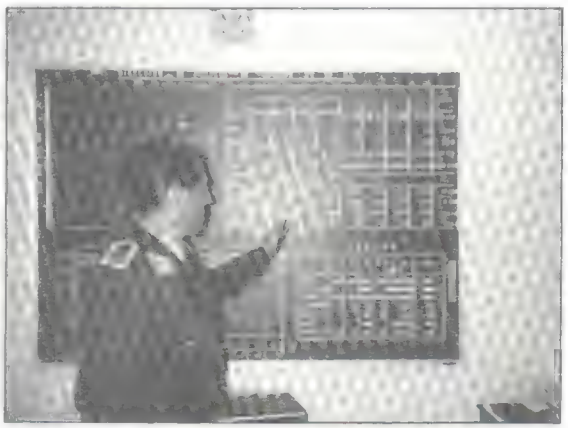
"We can get more powerful computers," he acknowledged, "but we can't get *better* computers. This is what we need—no more."

"We can get more powerful computers, but we can't get *better* computers."

SOPHISTICATED LOW-TECH

I didn't fully understand his explanation of how the system worked, but it went something like this:

The DEA in Washington, DC, sends a coded message to the base via satellite in a "burst" transmission. That is, the message is compressed beforehand by a computer so that the transmitted signal lasts only a few seconds. The signal is picked up by the satellite dish on top of the tent in Santa Lucia and fed directly into the 102. The 102 then restores the message to its original length and decodes it. To send a message, the operator types it into the 102, which compresses and encodes it before sending it to the transmitter. A pretty sophisticated operation using low-tech—that works—instead of techno-dazzle.



General Juan Zarate, chief of Peruvian drug police in Lima, instructs the author with a chart of coke-producing areas of the Upper Huallaga valley.

By that time, the DEA team was saddled up and heading out for a briefing for the operation. Our pleas to accompany them fell on deaf ears. We were directed to return to the airstrip to board a C-123K aircraft bound for the capitol city of Lima, and fifteen minutes later, we were airborne. We never did learn the outcome of the raid. Secret, you know.

Mike Nugent of *Portable 100* has been after me for years to really get into my Model 102. He's told me countless times, "You can do so much with it, you'd be surprised."

After what I saw at Santa Lucia, I'm no longer surprised.

Boris is a very interesting fellow who does some very interesting things. He also disappears a lot. Every so often, he pops up with some interesting news. Then he disappears again.

COMPATIBILITY: All portable computers.

The Road Warrior Meets the Road Weary

Bill reviews the CP+Road Warrior Laptop Toolkit.

by Bill Brandon

Soon after I began carrying my Model 100 on business trips, a universal truth was revealed to me: a built-in modem is pretty useless if you can't hook it up to anything. An awful lot of hotel phones are hard-wired into the wall, you see, so that you can't use your direct-connect modem cable.

Acoustic cups are only marginally acceptable, so many business travelers put together a basic do-it-yourself hotel room rewiring kit. Usually this consists of various screwdrivers, wires, modular jacks, and alligator clips, packed up in plastic bags. These kits have what you need, most of the time. They also provide no end of amusement for airport x-ray machine operators.

Furthermore, in your office or in your prospect's/client's office, you have another problem: digital phone systems. These modern wonders hang up any time a computer is connected to them. You can't wire around this problem, and the telephone company wants unbelievable bucks to install a separate data-grade line.

A NEAT SOLUTION

The solution to both sets of problems recently arrived on my doorstep in a neat green nylon pouch: The CP+ Road Warrior Laptop Toolkit will enable you to connect your portable computer or fax machine to ALMOST any telephone, digital or not, and do it with professional style and grace. No more will you be embarrassed in a client's office, by having to pull out zip-lock bags filled with ratty-looking hunks of wire so you can hook up your laptop to fire off that million-dollar order. (For pay phones, alas, you still have to have acoustic modem cups.)

FIRST IMPRESSIONS

I wish I'd had a suitcase full of these kits. I'd have sold 'em all. Every laptop-toting traveler, every client, literally, that saw this kit during the three months of evaluation wanted to buy it.

The kit, as I mentioned, comes in a neat zippered pouch. A place for everything and everything in its place—very businesslike. Open it up and you find:

- A pair of alligator clips attached to a two-foot length of phone wire, with a standard male modular clip on the other end (for use when the only way to connect is by disassembling the phone and hooking directly to the phone line conductors inside the mouthpiece or the phone body);
- A small flashlight/magnifying glass combination (useful when you have to crawl under the motel bed, take the telephone wall plate off and connect your alligator clips there because you can't get the phone apart);
- Twelve feet of phone wire, with male modular clips at each end (so you don't have to stay on or under the bed to use your computer);
- A small knife (use not recommended, but it's there in case you have to strip insulation off of any phone wires to make a connection);
- A small double-ended screwdriver (Phillips and slot blades, a thousand uses for each);
- A T-connector, or double-modular jack (to allow having both the phone and the computer connected to the same wall jack, assuming you're lucky enough to be in a motel with a modular jack);
- A device consisting of two alligator clips and a female modular adapter for the smaller connectors found on the handsets of phones (useful if you have a portable fax machine);
- The heart of the kit, the CP+ Connection (more about this below);
- Instructions for more ways to rewire a telephone than you ever imagined.

The pouch itself has a couple of extra pockets; you could tuck a Worldport modem in one, and extra AA's in the other.

I wish I'd had a suitcase full of these kits. I'd have sold 'em all. Everyone with a portable that saw this kit wanted to buy it.

THE CP+ CONNECTION

The CP+ Connection solves the problems created by digital phone systems not compatible with modem communications. This includes communication from computers and from fax machines.

The CP+ Connection is a small box with several modular jacks built in. Connections are made to the modem and to the phone; various switches on the CP+ Connection are set according to the type of telephone system you have. Suddenly, you can use your computer on your digital line. You no longer need a separate dedicated line for your modem. You set the Connection for *Data* when using your

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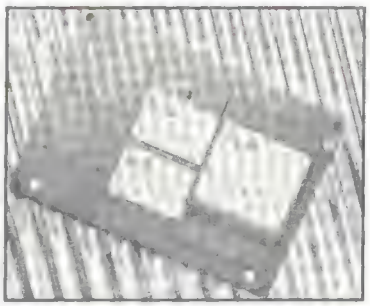

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- **Adds both RAM and ROM expansion, with addressable memory up to 16MB thru two card ports.**
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modem, and for *Voice* when you have a phone call. You can even use the Connection with Digital PBX systems without modular jacks.

COMPLETE INSTRUCTIONS, COMPLETE CONNECTIONS

The instructions are very complete. I think that simple line drawings would make things easier for those who are new to telecomputing, but this is not a major criticism.

I tested the kit with AT&T System 75 and Spirit equipment in various offices, as well as with conventional analog phones and hotel phones. My trusty Model 100 assisted in these tests. I was able to make a solid connection every time, with far less effort than using my old home-made kit. I'm quite sure that the Road Warrior's components are compatible with any other computer made, though I didn't make the acid test—my dad's Commodore 64. The instructions indicate that the CP+ Connection will also work with Rolm, Toshiba, NEC, and Meridian systems. The help card says you can dial with either the telephone keypad or your autodial, except on Rolm and System 75, where you must dial from the telephone keypad.

BLEMISHES

The problems with this kit are pretty small. In addition to slight improvements being possible in the documentation, a couple of minor fixes would make this setup perfect. The screwdriver included is not easy to use because of its double-ended design. An *offset*-type screwdriver would be more useful in tight places, easier to hold onto, and would give better leverage for taking screws out of phone bases or wall plates. Small foam plastic covers for the modular clips would protect the little plastic tangs from snagging and breaking off.

I was very impressed by the quality and utility of the CP+ Laptop Toolkit.

SUMMARY

I was very impressed by the quality and utility of the CP+ Laptop Toolkit. This thoughtful collection of useful devices and accessories must have been developed by someone who has spent a lot of time on the road. I may buy a couple of these as gifts.

I found the CP+ Road Warrior Toolkit to be complete, versatile, and easy to use.

In a way, this article is proof that it works—I uploaded it to CompuServe from my Model 100 via the CP+ Connection and our office System 75. If you travel, or if you have a digital phone system in your office, you need this kit!

Bill Brandon is the manager, Employee Development for Atmos Energy Corporation. He is a long-time Model 100 enthusiast and wayfaring stranger on the highways and byways of commerce. Not to mention the backroads, ditches, and binjos of life.

Manufacturer's Specifications

CP+ Road Warrior
Laptop Toolkit—$139.95
(without CP+
Connection—$49.95)
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COMPATIBILITY: Tandy MS-DOS 1400 series and 1100FD.

Squish (*Plus*) Your Files

Put 1.4 megabytes of—stuff—in a 720K bag.

by George Sherman

All right, class, how many of you with MS-DOS machines, particularly those of you with Tandy 1400 LT's, have thought about investing in a hard drive? Good. Now all of you who have not suffered from sticker shock at the price of most of the available drives lower your hands. OK. Of those remaining, how many of you would be willing to forgo the immediate purchase of a hard drive, and the serious wounding of your financial stability, not to mention your credit rating, if you could squeeze 1.4 MEGABYTES of storage space onto your 720K floppies? If you are in this category, then please read on. (If you already own a hard drive, this will still be of interest to you as well.)

Press Release:
Sundog Software Corporation [has recently begun] shipping *Squish Plus*, a new DOS driver that doubles the capacity of hard and floppy disks, enabling users to store twice as much data without disruption and expense of installing new hardware ...
Squish Plus is completely transparent, so users always have instant access to their compressed data, without interruption and without changing the way they work.

The above statements were issued by Sundog Software Corporation. But what is it and what does it do? If you are familiar with compression programs such as *ARC*, *PKARC*, and *ZIP*, then you have some basic idea of what *Squish Plus* is. The difference is that once *Squish* is up, running, and attached, you give little thought to it. Well, you do when your screen says you have 1 meg or better remaining on your disk after you have just downloaded a huge file of over 300K.

According to Sundog Software Corporation, *Squish Plus* is a logical device driver that has the same on-the-fly convenience as a *terminate-and-stay-resident* (TSR) program. It also compresses files of all types: databases, source code, documents, fonts, graphics, spreadsheets, etc. And it does it exceedingly fast. *Squish* is supposed to "double" the space on your disk. Theoretically it does. Squishing a 720K disk gets you approximately 1.4 megabytes of storage space on the disk. However, like any compression software, *Squish* compresses some files better than others. For instance, it can reduce a data file as much as 50 percent and possibly more. But a *.COM*, *.EXE*, or *.OVL* file will compress closer to 18 percent and maybe less.

It can reduce a data file as much as 50 percent and possibly more.

On the other hand, Squish has another very nice feature. In addition to compression, it also uses unused space left over on clusters from previous downloads. As an example, if a file containing only two bytes is downloaded to a disk, that file takes up a 512-byte segment, or cluster, on the disk leaving 510 bytes of space unused.

Under normal use, you have no way to use the empty space. *Squish* on the other hand, searches out these leftover spaces and uses them for storage along with the full 512-byte clusters. This enables it physically to place more information in the same space.

Squish Plus comes on either a 5.25-inch or 3.5-inch floppy and is unprotected; i.e., it can be copied to other disks in whole or in part depending on your personal needs. The disks contain the following files: *SQPLUS.SYS*, *ATTACH.EXE*, *DETACH.EXE*, *MKDISK.EXE*, *INFO.EXE*, *MINSIZ.EXE*, and *README*. You are required only to place *SQPLUS.SYS* on your boot-up disk. Then, using an edit program or some other means, insert in your *CONFIG.SYS* file the statement *DEVICE=d:\path\SQPLUS.SYS*, where *d:\path* is the drive and path on which you have the *SQPLUS.SYS* file. Reboot, and you are up and running—almost.

As you boot up, *Squish Plus* assigns a letter to what it calls a "squish disk." In my configuration, that letter is *E*. The squish disk is actually a *virtual* disk established as a file on a *physical* disk. Next you choose a disk on which you want to place a squished file. Now run *MKDISK* by entering *MKDISK [d:][path]filename[.ext]*, where *[d:]* indicates a physical drive, and *filename[.ext]* is the squish disk you are establishing (the parts indicated between brackets are optional). *MKDISK* displays the maximum size squish disk you can make and then asks how much physical space you want to use. Following your reply, *Squish* initializes the "disk." Actually what it is does is clear space on your disk in the physical amount you requested, and it establishes a file with the name you gave it. *MKDISK* then tells you how much compressed space you have available in that file—approximately double the physical size. Next you must run *ATTACH* to tell *Squish Plus* to attach itself to this new file. As an example: *ATTACH E: TO [d:][path]filename[.ext]*. It is at this point that *Squish Plus* "fools" MS-DOS into thinking it has another drive attached, complete with drive letter, directory, a file allocation table (FAT), the

whole works. And from this point on, you and the computer treat this "drive" as such. Do you want to squish a letter entitled *PROPOSAL.DOC*, which currently resides on drive A? Simply *COPY PROPOSAL.DOC E:*. Need to read it later? Just *TYPE E:\PROPOSAL.DOC*. It's that simple.

Before power down, you should *DETACH* your squish disk. All you need to do here is *DETACH [d:]* where *[d:]* is the disk letter assigned to your squish disk. If you forget to do this, don't worry. When you re*ATTACH*, *Squish Plus* gently slaps your wrist for forgetting and takes a little longer to connect as it recalculates available space.

The remaining programs are utilities. *INFO* tells you which squish disks are attached (yes, you can have more than one) and displays their vital statistics. *MINSIZ* sums up the actual amount of disk space your source file will consume and then gives a rough estimate of the minimum size squish disk it will need.

README contains the updates since the manual was printed, as well as some suggestions for maximizing your use of the available space set by *Squish Plus*.

Oh, yes. When you first establish a squish disk, you are given the option of protecting it with a password of up to eight letters and/or numbers. The password is case specific and is not displayed on the screen as you type. *MKDISK* checks the spelling by asking you to type it twice. If you later want access to your "disk," you had better remember the EXACT spelling because the password is encrypted before being stored and cannot be displayed.

DOES IT WORK?

How does *Squish Plus* work in practice? I am a fanatical user of *TAPCIS*, the program by Howard Benner that enables complete hands-off operation on CompuServe. I previously channeled all my downloads to disk *B:*. My 720K of available space disappeared rapidly. I was constantly shuffling files onto other disks or deleting older files to make room for new. After receiving my test copy of *Squish Plus*, I formatted, then initialized, a new disk with a squish disk file called, *TAPCIS.DSK*. Next I *ATTACH*ed *E:* to *B:\TAPCIS.DSK*. and copied into it all the files formerly on disk B. I ran *TAPCIS* and changed my download path to *E:*, then phoned CompuServe. There was a slight difference in time when *TAPCIS* first accessed drive *E*. After that, I could tell no difference as *TAPCIS* hooked up to several different forums, quick-scanned the message titles, and recorded them in *.MSG* files on *TAPCIS.DSK*. After *TAPCIS* logged off, I ran *TAPMARK* to mark the messages of interest on each forum and reran *TAPCIS*. In neither case was there an appreciable difference in time used. After *TAPCIS* logged off the second time, I ran *TAPORDER* to sort and organize the downloaded messages for subsequent reading. In this case, there was a noticeable lengthening of the time normally taken by *TAPORDER* to do the task. However, I was not unhappy enough with this delay to detract from my enjoyment of *Squish Plus*.

On one of the CompuServe forums a while back, one of the participants stated that if he could figure out a way to get 1.4 MB on the 720K disks in his 1400 LT, he would think long and hard before investing in a hard drive. The time is now, and the way is here: *Squish Plus*.

(Now if they could just figure out how to do this with an M100/102 and a Portable Disk Drive. Hmmmmmmmm.)

BY GEORGE!

Manufacturer's Specifications:

Squish Plus—$99.95
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COMPATIBILITY: Tandy 100/102

A Model 100 Machine Language Development System

Many times I've been asked how I develop machine language programs for the Model 100, which assembler I use, etc. This month, I describe my personal Model 100 Machine Language Development System. Do not expect a tutorial on how to program in machine language here. The following just describes what I use.

I hate to disappoint you, but I do not develop machine language software *on* my Model 100. Instead, I develop it on my TRS-80 Model 4P and then port the product over to my Model 100 to test and run it. This has a decided advantage in many respects. First, the Model 100 is prone to crashing during the debugging of new programs. This way, I avoid losing my source code. Second, the Model 4P screen offers a bigger picture of the source code listing as I write a program. The more of the code I see, the easier to keep track of it. What I am describing can be adapted for those who have older Z-80 based Kaypro computers or perhaps have just about any old CP/M computer lying around. So dust off that old computer, find your editor/assembler, and program away.

I use the Radio Shack Editor/Assembler *that I bought for my Model 4P.*

I use the Radio Shack *Editor/Assembler* that I bought for my Model 4P. The TRS-80 has a Z-80 processor chip, a close cousin to the 80C85 processor chip in the Model 100. The Z-80 has more commands than the 80C85, but if you eliminate those extra commands from your code, the resulting code will run on the Model 100. If you were to look at the commands available for the Z-80 processor versus the 80C85, you would notice two different types of commands. The 80C85 lacks the relative jumps available on the Z-80 and has no opcodes that take more than three bytes of code. You'll notice also two other minor differences like *RIM* and *SIM* commands, neither of which I understand nor have ever needed.

The Radio Shack *Editor/Assembler* was written for the Model I and III, so Model 4 owners can use the Model III mode if they don't have an editor/assembler written specifically for the Model 4. Also, *80 Micro* once published modifications to *EDTASM/CMD* that could be incorporated so that you could use the R-S *Editor/Assembler* in the Model 4 mode.

```
10 CLS:CLEAR50,MAXRAM:A2=MAXRAM
20 IFHIMEM<>MAXRAMTHENPRINT@125,"HIMEM E
RROR! STARTING OVER.":FORN=1TO500:NEXT:C
LS
30 CLEAR150,A2:MAXFILES=1:OPEN"HEX.DO"FO
R INPUT AS 1
40 PRINT@55,"Loading"
50 A$="0123456789ABCDEF":A1=65535:GOTO10
0
60 B$=INPUT$(1,1):IFASC(B$)=13THENB$=INP
UT$(1,1):GOTO60
70 P=(INSTR(A$,B$)-1)*16
80 B$=INPUT$(1,1):P=P+INSTR(A$,B$)-1
85 CK=CK+P
90 RETURN
100 GOSUB60:B=P:GOSUB60:IFB<>1THENFORM=1
TOP:GOSUB60:F$=F$+CHR$(P):NEXT:PRINT," "
F$:PRINT:GOTO100
110 IFP=2THENP=258
120 IFP=1THENP=257
130 IFP=0THENP=256
140 B=P-2:GOSUB60:A=P:GOSUB60:A=A+P*256:
IFA1>ATHENA1=A:IFHIMEM>ATHENA2=A:CLOSE:G
OTO20
150 FORM=1TOB:GOSUB60
160 IF(A>62959ANDA<63145ORA>63360)THENPR
INT"DATA ERROR":END
170 POKEA,P:A=A+1
180 NEXT:IFA4<A-1THENA4=A-1
190 GOSUB60:IFP=1THENGOSUB60:GOTO110ELSE
IFP<>2THENPRINT"FILE ERROR":END
200 GOSUB60:B=P-2:GOSUB60:A3=P:GOSUB60:A
3=A3+P*256
205 C1$=INPUT$(2,1):IFNOTEOF(1)THENINPUT
#1,C1:IFCK<>C1THENPRINT"Checksum does no
t match. Save (Y/N)? ";:BEEP:A$=INPUT$(1
):PRINT:IF(ASC(A$)AND223)=78THENEND
210 CLOSE:BEEP:INPUT"Enter Filename to s
ave";F$
220 PRINTTAB(7)F$" has been saved"
230 PRINTTAB(8)A1;A4;A3
240 SAVEMF$,A1,A4,A3
```

Listing 1. LOADM.BA *reads an ASCII hex file called* HEX.DO *and converts it to a machine language program.*

ASCII HEX ... TO GO

Getting the code over to the Model 100 is another matter. Transferring a machine language program is not easy unless you do some preliminary work. So here is where—Ta Da!—a public domain program for the TRS-80 called *ORCTERM*, by Larry Payne, comes in. Versions were available for both the Model III and 4. Before the Xmodem file transfer protocol was in use on

TRS-80 computers, the standard procedure for transferring machine language programs by telephone modem was to convert those programs to an ASCII hex format. In ASCII hex, the value of each byte, which could be a binary number from 0 to 255, was translated to its hex equivalent. For example, the binary number 254 would translate to the hexadecimal value FE. This doubled the size of the program during the transfer, since it took two bytes of text to describe each byte of the file. When each byte was translated, the resulting ASCII hex file could be transferred over the modem (or by null modem cable) to the other computer. *ORCTERM* has a built-in facility to do this ASCII hex conversion, though any other ASCII hex conversion program available can do the same thing.

What became apparent to me early on with my experience with the Model I, III, or 4 was the orderly file structure of a TRSDOS disk file. The byte structure told where in memory the program started and ended and also told where the end of the program file was. I believe the same file structure is used for other Z-80 or 8080

The standard way to transfer m/l programs by modem was to convert them to ASCII hex format.

files for other computers. I capitalized on this knowledge to write a loader for my Model 100 that would use this file structure to load a program in the proper place in the Model 100. All I had to do was to write the assembly language program for the Model 100 and specify the starting address where the program would run, rather than expect it to run in the TRS-80. (It wouldn't run on the TRS-80 anyway, since the code uses ROM calls for the Model 100.)

I wrote a *BASIC* program called *LOADM.BA* to load machine language files that have been saved in ASCII hex format into my Model 100. The internal format of the ASCII hex file is the same representation (in ASCII hex) as used by a Radio Shack Model I/III/4 when it saves machine language programs (in

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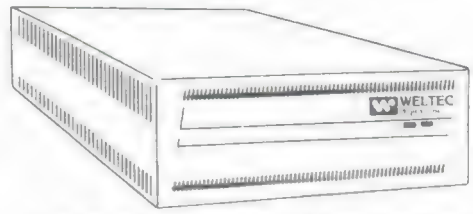

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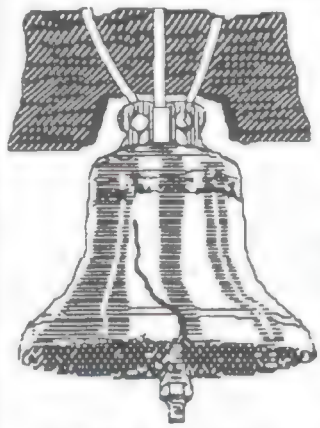

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binary representation) to disk. Any binary-to-hex conversion program for the Model I/III/4 can save the file in the correct form. So machine language program developers can use the Radio Shack *Editor/Assembler* (or similar) to create the machine code file on the Model I/III/4 computer and then transfer the completed program to the Model 100 for running.

I also wrote *SAVEM.BA*, a companion *BASIC* program that converts Model 100 machine language files to ASCII hex format. Using *LOADM.BA* and *SAVEM.BA*, in conjunction with the Model 100's *TELCOM* and a communications program on any another computer, users can save machine language programs to disk on the other computer. They can also upload and download machine language programs to and from bulletin boards for easy distribution. See Listings 1 and 2 for *LOADM.BA* and *SAVEM.BA*. Listing 3 shows the changes to make in *SAVEM.BA* for use on the Model 200. (*LOADM.BA* runs unmodified on both the Model 100 and 200.)

The following instructions for *LOADM.BA* and *SAVEM.BA* are written from the perspective of those two programs as companion programs, so that even those who have no interest in programming can see their usefulness for transferring non-ASCII files from one computer to another.

SAVEM.BA

To transfer a file (using *LOADM.BA*), first you must save it in ASCII hex format. *SAVEM.BA* lets you save Model 100 *.CO* files in that format, so you can easily save them to a file on another computer. To keep it simple, the following example uses *SAVEM.BA* to save my *SCRIPY.CO* program (a text processor, see *Portable 100*, Sept. '87 for Model 100, Feb. '89 for Model 200) in ASCII hex format.

First, set *HIMEM* for your Model 100 as you would for running *SCRIPY.CO*. In *BASIC* you would use the command *CLEAR 50,62640*, where *62640* becomes the *HIMEM* value. Now

BASIC BITS

```
10 'SAVEM.BA
20 MAXFILES=1:CLS:A1=PEEK(64440)+PEEK(64
441)*256+8:INPUT"Enter Filename";F2$:F2$
=F2$+"      ":F2$=LEFT$(F2$,6):FORN=1TOLE
N(F2$):F1=ASC(MID$(F2$,N,1)):IFF1>96ANDF
1<123THENF1=F1AND223
30 IFF1=46THENN=6ELSE F$=F$+CHR$(F1)
40 NEXT:F$=LEFT$(F$+"      ",6)+"CO":PRI
NTF$" ";:A=VARPTR(F$):A=PEEK(A+1)+PEEK(A
+2)*256:FORN=0TO5:POKEA1+N,PEEK(A+N):NEX
T
50 LOADMF$:A=PEEK(64440)+PEEK(64441)*256
+8:A2=INT(A/256):A1=A-A2*256:F$="":B=VAR
PTR(F$):POKEB,8:POKEB+1,A1:POKEB+2,A2
60 PRINT:A$="0123456789ABCDEF"
70 F1$="":F1=VARPTR(F1$):POKEF1,8:FORN=6
3933 TO 64138 STEP 11:POKEF1+1,N-INT(N/2
56)*256:POKEF1+2,INT(N/256):IFF$=F1$THEN
F1=PEEK(N-1)*256+PEEK(N-2):N=65000
80 NEXT
90 LS=PEEK(F1):MS=PEEK(F1+1):B1=PEEK(F1+
2)+PEEK(F1+3)*256:SL=PEEK(F1+4):SM=PEEK(
F1+5):F1=LS+MS*256:F$=LEFT$(F$,6)+".DO":
INPUT"Output Filename";F$:PRINT"Compilin
g ASCII/HEX Code for "F$:OPENF$FOROUTPUT
AS1
100 CK=13:PRINT#1,"05008";:M=3:FORN=ATOA+
7:X=PEEK(N):GOSUB180:NEXT
110 IFB1>=256THENB=0:B2=255ELSEB=B1:B2=B
-1
120 IFB=255THENB=-1
130 IFB=254THENB=-2
140 B1=B1-256
150 X=1:GOSUB180:X=B+2:GOSUB180:PRINTH$;
:X=LS:GOSUB180:PRINTH$;:X=MS:GOSUB180:PR
INTH$"  ";:FORN=F1TOF1+B2
160 X=PEEK(N):GOSUB180:NEXT:IFB1>0THENMS
=MS+1:F1=N:GOTO110
170 X=2:GOSUB180:GOSUB180:X=SL:GOSUB180:
X=SM:GOSUB180:PRINT#1,"":PRINT#1,CK:CLOS
E:PRINT:PRINT"ASCII/HEX File Complete":B
EEP:MAXFILES=0:END
180 CK=CK+X:H=INT(X/16):H$=MID$(A$,H+1,1
):H=X-H*16:H$=H$+MID$(A$,H+1,1):PRINT#1,
H$;:M=M+1:IFM=31THENM=1:PRINT#1,""
190 RETURN
```

Listing 2. SAVEM.BA saves machine language programs in ASCII hex format (a .DO file) for easy transfer to your other computer. Do not change line 10. It is needed for this program to run properly.

```
20 MAXFILES=1:CLS:A1=PEEK(63083)+PEEK(63
084)*256+8:INPUT"Enter Filename";F2$:F2$
=F2$+"      ":F2$=LEFT$(F2$,6):FORN=1TOLE
N(F2$):F1=ASC(MID$(F2$,N,1)):IFF1>96ANDF
1<123THENF1=F1AND223
50 LOADMF$:A=PEEK(63083)+PEEK(63084)*256
+8:A2=INT(A/256):A1=A-A2*256:F$="":B=VAR
PTR(F$):POKEB,8:POKEB+1,A1:POKEB+2,A2
70 F1$="":F1=VARPTR(F1$):POKEF1,8:FORN=6
2136 TO 62642 STEP 11:POKEF1+1,N-INT(N/2
56)*256:POKEF1+2,INT(N/256):IFF$=F1$THEN
F1=PEEK(N-1)*256+PEEK(N-2):N=65000
```

Listing 3. To convert SAVEM.BA for the T200 (SAV200), make these changes by replacing the corresponding statement lines in Listing 2.

run *SAVEM.BA*. When asked to enter the file name, enter *SCRIPY.CO* (you need not include the *.CO* extension). It will then ask you to enter the output file name. If you just press *ENTER*, the program will name the output file *SCRIPY.DO*. For now, enter the name *HEX.DO* (again, the extension is optional). Sets of three pairs of ASCII hex numbers will be displayed until the entire program has been converted. The program will tell you when it has completed its task.

That's all there is to converting a machine language program to ASCII hex. You can use *TELCOM* to transfer this file to another computer, either over telephone lines or by using a null modem cable. *SAVEM.BA* saves the file including the name of the program, *SCRIPYCO*. It includes checksum information for later use by *LOADM.BA* (to make sure none of the file got corrupted during transfer), as well as all information it needs to convert the program back to *SCRIPY.CO*.

LOADM.BA

Using *LOADM.BA*, you can convert the file named *HEX.DO* back to *SCRIPY.CO*. When you run *LOADM.BA*, it looks for a file called *HEX.DO* (and only that name), converts it to machine language and saves the converted file.

HEX.DO files created by *SAVEM.BA* contain checksums. *HEX.DO* files created on the Model I/III/4 do not. *LOADM* looks for checksum information and, if found, takes it into account.

It can be fooled, however. If you download a program from a bulletin board or other computer, you may get extraneous data tacked onto the end of the file. If a file does not contain a checksum, but does contain extraneous data, you will get a message that the checksum doesn't match, with the option to save or not to save the program. If you know that there is a checksum provided, then you should suspect that the download was bad because of extraneous data. If you know that no checksum is present, then ignore the message and save the file by answering yes. Take a look at the *HEX.DO* file you created so you will know what it is supposed to look like.

It includes a checksum, to make sure the file wasn't corrupted.

In normal use, it is best to save the ASCII hex file with the same name as the *.CO* file. *SCRIPY.CO* conversion would be saved as *SCRIPY.DO*. This is so you can keep track of your file. When you want to convert it back to machine language, go to *BASIC* and use the command, *NAME "SCRIPY.DO" AS "HEX.DO"* so that *LOADM.BA* can find it for conversion.

UNTIL NEXT TIME ...

The Model 100 programs described this month (which I have already placed in the public domain) are available on this month's *P100-To-Go* disk and *Portable BBS*, and thus, I will not be offering a distribution disk for the Model 100 as has been the tradition of this column.

However, if you have a TRS-80 Model III or 4, I will provide, as a convenience to readers, a TRSDOS 1.3 (Model III) disk with both the Model III and Model 4 versions of *ORCTERM* as well as a file called *SAVNLD.DO*, which contains *LOADM* and *SAVEM* plus instructions similar to what is written in this column. A Model 200 version of *SAVEM* will also be included (*LOADM* will run on either the Model 100 or 200).

To order the selection of programs described in this column or any other *BASIC BITS* column, send $7 along with the month and year of the column to 6237 Windward Drive, Burke, VA 22015. This includes packaging and handling. The cost per disk is not to pay for the programs but for the cost of distribution. A self-addressed label will speed your order.

by Thomas L. Quindry

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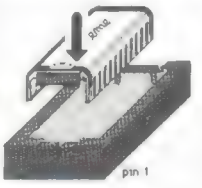

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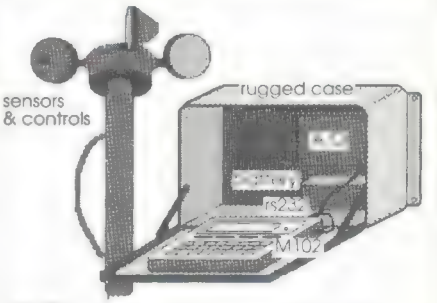

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Inside the Tandy 600

(Part 2 of 3 Parts)

This month, learn about I/O.

by Stevie A. Stark

In my first article in this series, I covered the CPU and some of the memory devices in the Model 600. You learned that it was possible to build a working computer with just these two types of components and little else. However, you don't need much imagination to realize that this computer would be pretty useless. How would you enter data, or see the results of a program you executed? You've got no way to print or save a program you've written.

So the next subject I'll cover will be *I/O* (input/output) devices. These are the devices that let the CPU-memory communicate with the outside world. But before we jump off into I/O devices, I would like to cover one concept first. Interrupts.

THE INTERRUPT

Suppose you are sitting down at the dinner table eating your supper, and the phone in the living room rings. If you are like most of us you'll get up from the table, go into the living room, and answer the phone. Let's examine what happens. You are busy processing your dinner (eating) and the phone rings; thus it *interrupts* you. At this point, you have two choices. Let the phone ring until it stops or answer it. Since you are having liver this night, you decide that finishing dinner is not such a high *priority* that you can't answer the phone.

You are probably wondering what this has to do with computers. Computers have the ability to respond to interrupts. Most microprocessors including the 80C88 have dedicated inputs for interrupts. These *interrupt inputs* are connected to some of the I/O devices in the system. When an I/O device needs service (say, when someone presses a key on the keyboard on a typical PC), it tells the CPU via the interrupt inputs. This causes the CPU to check the priority of the device requiring service. If the CPU's current task is not a higher priority, it stops what it is doing and jumps to a predetermined service subroutine to take care of the interrupting device's needs.

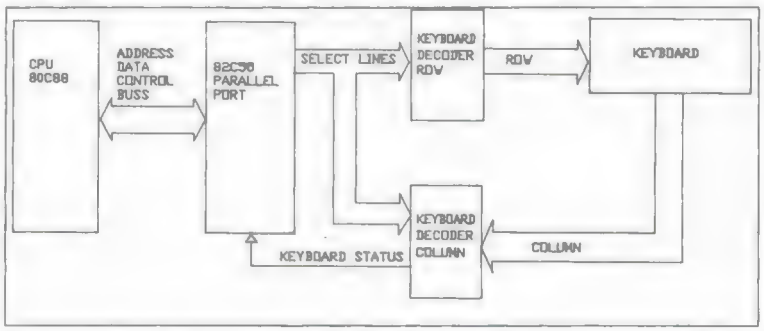

Figure 1. Keyboard Interface.

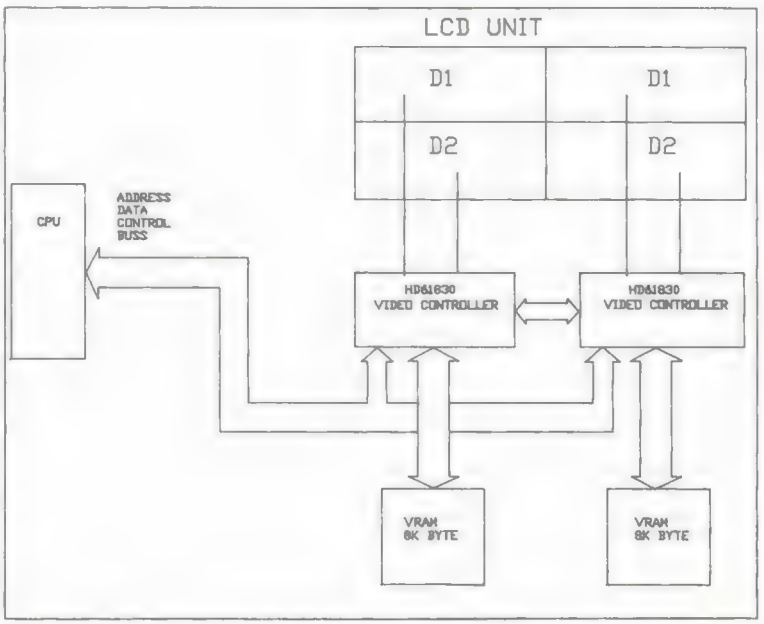

Figure 2. Display Interface.

Keep in mind that the need for interrupts is brought about because of the need to free the CPU from the time-consuming task of having to check each I/O device periodically to see if it needs service. This would be like having a telephone with no ringer. You would have to pick up the phone every sixty seconds to see if anyone was on the line or you would miss a lot of calls.

BASIC I/O DEVICES

I/O refers to a device that can move data into or out of a computer or subsystem. In effect, these devices are

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ports for data much like a seaport is for ships. Thus we have the name of the most basic I/O device, the *I/O port*. I/O ports can be either serial or parallel. Serial refers to each bit of data being sent one after the other, or *sequentially*, on a single wire (in a *serial stream*), while parallel refers to data bits being sent at the same instant (usually eight bits at a time) on multiple wires. So you can see that a parallel port can send a full byte (eight bits) of data in the same time it takes a serial port to send one bit.

Usually, larger I/O *subsystems* such as a modem or a printer port will have I/O ports built into them.

THE SYSTEM CONSOLE

The system *console*, the keyboard, is obviously an important I/O device. In some computers, such as an IBM PC, it is a serial device. Essentially, *this* type of keyboard contains its own CPU that communicates with the PC's CPU through a serial link.

However, the Model 600 has an entirely different setup. Figure 1 shows the Model 600's keyboard connected to a parallel port. Periodically, the CPU reads from a parallel port to see if any activity (a key depression) has occurred. The CPU supplies a seven-bit code, representing a column out of a sequence of rows, to the keyboard decoder. These columns and rows represent a grid of the possible keys on the keyboard. The keyboard decoder detects which key is depressed and directs this information to an input port (it signals with a single bit, either on or off). If any key has been pressed, the bit representing the key (status bit) will be on. Sequencing through the rows of bits, the CPU reads the contents of the input port and determines which key was pressed.

THE DISPLAY

The one device that gives visual information from the CPU is the display. A conventional desktop display is also known as a CRT (cathode-ray tube), tube, monitor, and a host of other names. Basically, this CRT is a TV with some wrinkles thrown in. Most all displays today are serial devices and receive video information through a special circuit known as the *video controller*.

Its principle is simple. The CPU sends data to the video controller, and the controller sends it to video RAM because the CPU cannot access the video RAM directly. The video controller converts this information stored in video RAM into a video signal, which it sends to the display.

As you know, the Model 600 does not have a television-type CRT display. It has a flat panel LCD (liquid crystal display). In spite of this, it follows the same principle as a regular CRT display with the exception of having two controllers that connect to the system data *bus* (the wires that link the CPU to all its devices). The two controllers (HD61830) are necessary because the Model 600's one flat display is actually two separate displays, one for the left and one for the right. Figure 2 shows the basic layout of the display circuitry. As you can see, the HD61830 video controllers divide their displays into two halves. Thus, the entire display is made up of four quadrants.

Each half of the display contains 128 x 240 *pixels* (a pixel is the smallest point on the display that can be turned on or off). You'll find 61,440 pixels in the Model 600 display (128 x 240 x 2) or, put another way, 128 x 480 *resolution*. For every pixel on the display, there is a corresponding bit in video RAM that contains information on whether that pixel is on or off. You can appreciate why separate controllers are used for video displays. Imagine the

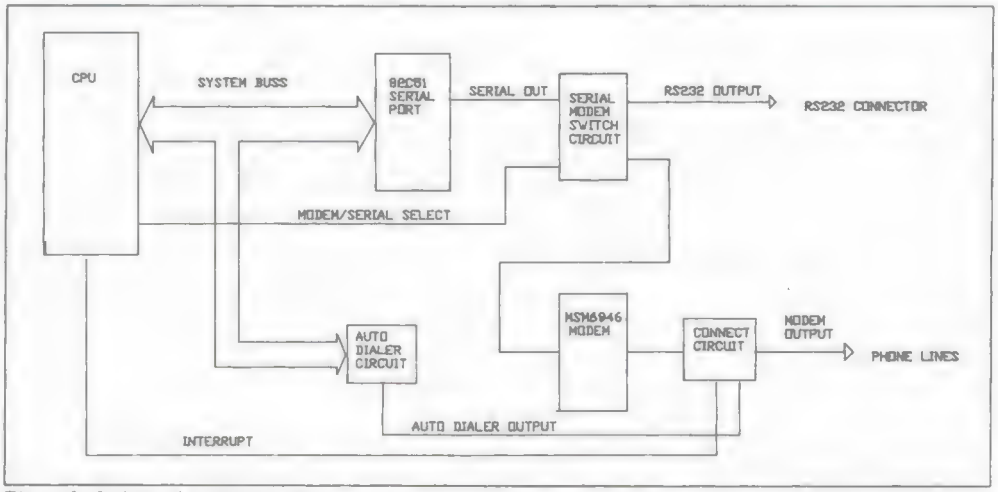

Figure 3. Serial and modem interface.

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③ **Inside the Model 100** by Carl Oppedahl "...an excellent Guide"—New York Times. A thorough guide to the Tandy Model 100. Learn about A.L. programming; disassembled ROM routines; keyboard scanning; UART, RS-232C, and modem; Clock/calendar chip; Interrupt handling; 8085 instruction set-$21.95.

④ **User Guide and Applications for the TRS-80 Model 100 Portable Computer** by Steven Schwartz. 14 ready-to-run programs for business: statistics, graphics, sound, and more. With cassette tape-$44.95. Buy them separately— the book is only $19.95; the cassette tape is only $27.00.

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CPU having to write to each pixel in the display, turning it on or off. It would spend most of its time doing video updates.

THE PRINTER PORT

The printer port, of course, is a port for communicating with a printer. All printer ports labeled as such are going to be parallel unless otherwise noted. The Model 600's port is parallel. Like other parallel printer ports, it has some lines in it configured as outputs and some as inputs. The printer uses the input lines as status lines to synchronize or control the data flow from the printer port. The output lines carry data and control signals from the computer to the printer. The port is configured according to the guidelines for a Centronics printer port. (Another printer port type does exist, Dataproducts, usually found—not very often with PC's—on very high speed printers.)

The hardware device that makes up the printer port is an 81C55. This device, a 24-bit parallel port, actually is three separate ports. Port 1 is both the printer data output port and keyboard address select port. This port is *time multiplexed* (two distinct sets of signals use the same set of signal lines at different times). The control and status signals originate from ports 2 and 3.

When a document is to be printed, it is loaded into port 1 one byte at a time. If the printer is on line, it sends a status signal to port 3 that tells the CPU it is ready to receive data. Then the CPU loads a *strobe* bit into port 2, which it sends to the printer, causing the data appearing on port 1 and the printer inputs to be loaded into the printer, where the data is printed.

THE SERIAL PORT

Just as the name suggests, the serial port is an I/O port that outputs or inputs data in a serial stream. This serial port conforms to the specifications laid out for an RS-232 port. While you need not concern yourself with the technical specifications of RS-232, you should remember the name, important to know when you shop for peripherals to add to this port.

Figure 3 shows the serial communications circuit. The 82C51 is the device that converts parallel data from the CPU into a serial data stream. The 82C51 connects directly to the address and data bus so that the CPU can read and write to it. It has interrupt lines going to the CPU so it can inform the CPU that it requires service. One of these interrupts is the *receive buffer full* interrupt, which signals the CPU when the serial port has received a new character. This port has a few peculiarities in the Model 600. You can switch the serial port to a modem circuit instead of the DB-25 (25-pin) connector for RS-232 output.

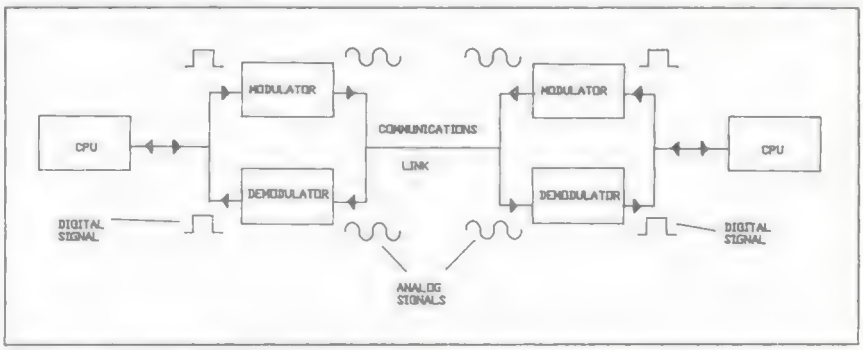

Figure 4. CPU-to-CPU link-up via modem.

THE MODEM

The modem is a device that prepares a serial data stream for transmission over the telephone lines. The name modem is an acronym for *mo*dulation/*dem*odulation, referring to the process of converting a serial data stream (a series of bits) into an *analog* signal (occurring as tones from a phone) and converting the analog signal back into a serial data stream.

Figure 4 illustrates the concept of a CPU connected to another CPU via a modem link. The modulation/demodulation functions in the Model 600 are controlled by a MSM6946 integrated circuit. This is a 300 bit-per-second frequency shift keyed (FSK) modem. The modem subsystem consists of a connect circuit, which generates an interrupt for the CPU when it detects a ring and provides the interface to the phone lines; an autodialer circuit, which the CPU can write to and generate the dial pulses; and the MSM6946, which is capable of two-way communications.

From Figure 3 you can see the general configuration of the Model 600's modem. Space limits keep me from going into a detailed operation of the modem. Briefly, when information is to be sent through the modem, the CPU switches the output of the serial port to the modem. Here, it is modulated into a signal suitable for Ma Bell and sent on its merry way. When data comes in on the phone line the modem demodulates the signal back into a digital signal that the CPU can understand.

FINAL THOUGHTS

This has been quite a lot of material to cover. Some of it may not make much sense at first, but if you read and reread the parts that give you trouble you should begin to get more comfortable with the material. Next month, in Part Three, I will discuss the hardware of the Model 600 in whole. And I will evaluate a program written in *BASIC*, showing what the hardware does as the program runs.

DEFUSR appears monthly to answer your questions about Tandy notebook computers.

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M100 FLUNKS TRIG!

Where I work we use PC's to write code for our computer-controlled equipment. We always check that code before releasing it to the shop. This checking often takes more time than the programming, since it is done by using some other method to determine the answer. I use a calculator and was surprised how slow they are in trigonometric functions. (Oh, how smug we are in this age of computers!) I thought I'd write a program for my Model 100 to handle the trigonometric functions.

The program worked well, but my M100 answers never matched my calculator's! After a lot of checking, I finally discovered that the M100 does not know trig! Simple test: the tangent of 45 degrees is 1. Tell the M100 to *PRINT TAN(45)*, and it will gladly tell you it is *1.6197751905486*! That is the tangent of 58.31 degrees. We are allowed some pretty generous tolerances, but 13-degree errors are excessive.

Oh, yes, the question: Is it just my M100 that flunked math? Is there any way around it?

James E. Hardin
Lancaster, PA

Gee, nobody told me this tech editor gig would require trigonometry! Not one of my stronger skills, but I think I can help with this one.

Your Tandy's trig functions (TAN, ATN, SIN, COS) operate on angles expressed in radians, not degrees. To convert degrees to radians, multiply the angle in degrees by 0.0174533. Your choice of 45 degrees, for example, becomes 0.7853985 radians, and TAN(0.7853985) produces a result of 1.0000006732053. A tad more within tolerance, don't you think?

To convert radians to degrees, multiply the value in radians by 57.29578. (Boy, if my high school teachers could only see me now!)
-MN

DOWNLOAD TO NODE?

I have a Tandy 200 with Node 128K Datapac RAM disk. Is there any way that I can upload/download files to/from the RAM disk while in *TELCOM*?

Also, I have a broken Portable Disk Drive (100K). Where can I send it for repair?

Ronald K. Caldwell
APO New York, NY

Ultrasoft Innovations offers a repair service in their catalog.

How are your programming skills? The RAM+ *ROM provided with the Datapac lets the user access the Datapac from* BASIC. *Though I know of no existing program that downloads directly to the Datapac, it would seem possible to do in* BASIC. *Such a program would, of course, run slowly, most likely 300 baud or less.*

CUSTOM 200 author Paul Globman has been working with the Datapac to develop some neat little goodies. Perhaps he'll announce something like what you need in the future.

For disk drive repair, you can always bring it to Tandy, of course. And, though they don't advertise it here, Ultrasoft Innovations offers a repair service in their catalog. Perhaps they can help. You'll find their number in their ad.
-MN

MULTIPLAN/WITH BOOSTER PAK

I am always eager to open and read your magazine whether it's 100 pages or ten. The fact is that I regard it as a "personal letter," and I enjoy reading from beginning to end. I never fail to find something of interest.

My last letter to you required no answer, but I would be grateful for help with my current problem. I am unable to initialize my *Multiplan* (v. 100) ROM in the Booster Pak to run with the Tandy 102. It runs like a champ in the plain M100 and M102 (I have one of each); however, I cannot get it to initialize under any conditions in the Booster Pak. Can you tell me if this is a solvable problem and how I go about initializing it?

With *Multiplan, Ultimate ROM II, Sardine, T-Base, T-Word+*, and all the other goodies in my M102, along with 160K of RAM, I have nearly a perfect traveling computer. But I can't get *Multiplan* to do a thing in the Booster Pak. Please help me with this problem.

Thanks so much for the excellent support that you have given to my little lightweight monsters.

James Lewis Lowe
Norwood, PA

Traveling Software says that's a problem with both Tandy's Multiplan *and* IntSol *(Integrated Solutions) ROM's. The solution is to re-burn the ROM. Send them the* Multiplan *(or* IntSol*) ROM, along with a check for $10.00 and a letter explaining that you'd like the ROM re-burned to work in the Booster Pak.*

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and ship it to you. For legal (copyright) reasons, they cannot return the original along with the copy; they retain it.

The custom ROM's will no longer work in an unadorned Model 100/102, only in the Booster Pak. Should you ever want to have your original ROM back, for example, if you've sold the Booster Pak, just send them the custom ROM, and they'll gladly return your original, free of charge.

That should satisfy your "lightweight monsters!"

-MN

BAR CODE & PDD WOES

I would like help on a couple of problems. First, I have the Radio Shack bar code writer program (catalog #26-3845). Can someone tell me how to use it on the Epson printer?

Second, several times after using the Portable Disk Drive 2 (PDD-2) to load and save files, and *T-Word* to kill files, I have later found strange numbers and characters entered near the start of some of my *.BA* programs that were stored in RAM. Is this common, and can it be prevented?

Gero Mitschelen
Malott, WA

I believe the Tandy bar code program is designed to work with the unique graphics mode of Tandy printers. To make it work on an Epson might be tricky, and I don't have enough experience in that area. Perhaps some sharp reader can help us?

Your weirded-out files are <u>not</u> normal and indicate a dangerous situation, most likely scrambled file pointers, which will eventually cause a cold start.

I can't tell from your letter whether you're using T-Word *from the* Ultimate ROM II *or tape, nor which disk operating system (DOS) you're using. In my experience with the* Ultimate ROM II's T-Word *and with* TS-DOS *and* FLOPPY, *I've never had the problem you describe. Such problems are usually the result of machine language conflicts. If you've selected the* DOS-ON *feature of* TS-DOS, *for example, and then loaded another machine language program on top of it, that could cause problems. It's hard to say without more specific information.*

I suggest you back up whatever files you can and then perform a cold start yourself. This will clean out the machine and reset the pointers. Then reload your files.

Thereafter, keep careful track of which programs you run and in which order. If the problem recurs, you'll then have a better idea of the circumstances that led up to the conflict, and we'll have a better chance of diagnosing the problem. Meantime, make frequent backups of your files!

-MN

BASIC DIALECTS

Today I purchased 222 *BASIC Computer Programs*, by Don Roberts. I was hoping to gain an understanding of *BASIC* programming by working with the programs in the book. But the first program I tried wouldn't run.

I've enclosed a copy of the program from the book, along with the printout of the program as I typed it into my Tandy 102 and the printout showing the error in line 70.

I am a novice who is trying to understand the fundamentals of the *BASIC* language. What was my error? Can you recommend a "basic *BASIC*" book for novices? Help!

Thomas Chapoton
Jacksonville, FL

As you've discovered, there are various "dialects" of BASIC. *For example, the* PAUSE *statement you encountered in line 70 has no direct equivalent in Tandy notebook machines. The purpose of that* PAUSE *statement seems to be to print a prompt and then wait for the user to press a key. To accomplish the same thing on the Tandy 102, try something like this:*

```
10 PRINT "Whatever the prompt is"
20 IF INKEY$="" THEN 20
30 [program continues here after
   keypress]
```

For converting programs between BASIC *dialects, you might find* The BASIC Handbook, *by David A. Lien, a handy aid. It shows various statements in* BASIC *and suggests equivalents for other dialects. The book is available from Compusoft Publishing, P.O. Box 270820, San Diego, CA 92128. Telephone (619)789-7365.*

May I suggest looking for more Tandy-specific programs to learn on? For example, Portable 100 *has scads of back issues containing programs, complete with explanations of how they work. An article index is available; see our ad elsewhere in this issue. Or how about the various books available from Granite Street Portables (see their ad)? That might make learning a little easier.*

-MN

NEEDS MULTIPLAN DOCS

I have one of the earlier Model 100 units. Internal storage capacity has been raised to the maximum. My unit has served me exceedingly well for over four years of almost daily use. There is no comparison to the highly complicated computers used in my place of business. Greater storage capacity is in my future, but I have not decided upon which to buy, although I favor the Node system.

Does anyone have the instructions or the manual for the Microsoft *Multiplan* (version 1.00)? I have the ROM, but outside of knowing the *CALL 63013* to put it in operation, my knowledge of it is nil.

Assistance of any kind would be appreciated.

Bill Brewer
11901 Arabian Trail
Austin, TX 78759

Tandy no longer stocks the Multiplan *ROM (catalog #26-3829). However, the Tandy Mail Order Department occasionally receives discontinued or hard to find items and can sometimes notify interested parties when a particular item shows up. You can call them at (817)624-1196.*

The Tandy 200's built-in MSPLAN *might be sufficiently similar that you can get up and running with the T200 documentation. Might be worth a try.*

Meanwhile, I've listed your address so any readers with helpful information can contact you. Perhaps even James Lowe, whose Multiplan *v1.00 problem we solved above (see his letter), will be so overwhelmed with gratitude that he'll drop you a line. (Hint, hint!) Good luck!*

-MN

COMPATIBILITY: All notebook computers (with some variations)

TELCOM—Part 2
On the boards

In last month's column, you learned how to connect two Model 100's and pass information between them using the internal modem. That was actually a small model for what we'll be doing this month: using *TELCOM* and the internal modem to dial up and use "on-line" services, such as CompuServe and local bulletin boards (BBS's).

When you connect your computer to another computer, you gain one more resource to solve problems. When you connect your computer to an on-line service, you gain thousands of new resources. On a local bulletin board, you can ask for help and get several replies in a few days. On a national service, it's common to get dozens of replies and ideas in hours. As a business person, I've found this incredibly valuable. In addition to the experts available to you in every topic, you can tap into files, programs, databases, encyclopedias, and other gold mines to support your research.

So how do you get into this networked nation? To start with, you need a little equipment:

- You need a telephone line, preferably one without the call waiting feature.
- Just as last month, you need the Model 100 modem cable. I think this is the best $20 I ever spent on computer peripherals.
- If you take your Model 100 with you on business trips, and you expect to use on-line services on the road (including calling your office computer), you will probably need to obtain acoustic modem *cups*. These are needed for pay phones and others where you can't use the direct-connect cable.
- If you are on the road, you will also need a basic "bag of tricks" to help you connect to the various phone types. A description of the contents of this bag of goodies is in the review of the CP+ Laptop Toolkit, described elsewhere in this issue. At the very least, you want a screwdriver and a length of phone wire with a male modular clip on one end and alligator clips attached to the red and green wires at the other end.

MECHANICAL CONNECTIONS

Believe it or not, you will be making virtually the same mechanical connections and *TELCOM* status settings to communicate with an on-line service as you did last month to communicate with another Model 100. Ain't science grand?

If you are using acoustic modem cups, do any assembly required (probably just connecting the two cups with a wire). Plug the cord attached to the cups into the *PHONE* connector on the back of the computer. Skip the next five paragraphs of this article—they don't apply to you now.

You will also need a basic "bag of tricks."

For those using the direct-connect modem cable, begin by attaching your modem cable to the *PHONE* connector on the back of your computer. The rule for which of the two wires to use is best remembered as "beige to the bulkhead" (if you'll pardon a little sailor talk). That is, you put the male connector on the tan wire into the modular phone jack on the wall. If you want to have the computer and the phone both connected to the same jack, put the male connector on the silver wire into the modular jack on the back of the phone. Or you can use the "in-line" (double female) adapter that came with your modem cable to attach the phone cord to the silver wire from your computer.

What's that? You're in a hotel room that doesn't have a modular jack? *Nil desperandum, amicus* (Latin for, "No sweat, buddy!"). You recall that length of phone wire, with alligator clips on one end and a male modular clip on the other, mentioned earlier *[in the CP+ review, this issue]*. You need it now, along with the in-line adapter. You will also need the screwdriver to do what I am about to describe: telephone disassembly.

Before we do any radical surgery, see if there is an easy way to use your 'gator device. If you can unscrew the mouthpiece of the phone, take out the microphone and lift up the top aluminum bracket. You should see a green wire attached to the aluminum bracket. Unscrew the small U-shaped connector (spade attachment) that holds the green wire. On the bottom bracket, unscrew the spade attachment on the red wire. Connect the red alligator clip on your jury rig to the red spade connector and the green clip to the green connector. Connect the modular clip at the end of your jury rig to the modular clip on the tan wire from your computer modem cable, using the in-line adapter. You should now be able to proceed. Be sure to put all of this back together correctly when you are done with your call.

If you can't unscrew the mouthpiece, turn the phone over and carefully remove the two large screws in the bottom of the phone. Use both hands to keep the shell, base, and handset of the phone together as you turn the phone back right side up. Carefully lift off the cover of the phone; some hotel phones have a little "call waiting" light on top—the light is attached to the shell, so you will have to be careful not to break the wire that goes from the phone's harness to the light. As you lift the shell up, use one hand to press the switch hook down. I like to put the handset upside down onto the bare metal cradle while I make the rest of the connection. That way, I'm not driven crazy by the dial tone, and nobody down on the desk is going to start wondering what I'm up to.

With the shell off, look at the right side of the phone. You will see a wiring harness with about a zillion little tiny wires in it attached to a whole bunch of lugs.

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See the review in the November 1989 issue!

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Look for the red and green wires that come from the phone cable leading to the wall. Connect your alligator clips to these wires, red to red and green to green. Connect the male modular clip at the end of the 'gator rig to the modem cable with the in-line adapter.

By now, you probably feel like a character in a John LeCarre novel. It is nearly time to go on-line.

FULL POWER

If you are using a direct-connect cable, set your *DIR/ACP* switch to *DIR*. If you are using the acoustic cups, set the *DIR/ACP* switch to *ACP*. In either case, set the *ANS/ORIG* switch to *ORIG*.

MAKING YOUR ENTRY IN *ADRS.DO*

After you get your connection made and your switches set, you can turn on your Model 100. Go to *ADRS.DO* and set up your entry for the on-line service you want to call. If you don't have a subscription to CompuServe, GEnie, or similar pay service, you can enter the phone number of a local bulletin board. Don't know any BBS phone numbers? Find a copy of *Computer Shopper* at your local bookstore and look for a board in your area. Many bulletin boards carry an extended listing of other boards. You may have to make a long distance call to reach the boards listed in the *Shopper*. Some boards offer additional features that parallel what you can get on CompuServe, through special nationwide TRS80-related coverage and NETmail. While boards change frequently, here are some that you will probably find useful:

- *8/N/1 #1 BBS*: (904)377-1200 (Run by Guy Omer; downloadable Model 100 files, open BBS—no password required; set status for *8N1E*)
- *8/N/1 #4 BBS*: (215)848-5728 (Run by Luis Garcia-Barrio; no 100 files that I'm aware of, but it's an open BBS with a good message base that you can practice on; set stats for *8N1E*)
- *THE MOCHINE BBS*: (214)399-8414 (Run by Marc Nowell; lots of Model 100 files, and part of the national FIDO-net TRS80 network; you must register with Marc for access—explanation is on-line; set status for *8N1E*)
- *Portable BBS*: (603)924-9770 (Sponsored by *Portable 100* magazine; downloadable files and a good message base; set status for *8N1E*)

The first time you log onto any service or bulletin board, you will need to do it manually.

I realize that the rest of the country is loaded with high quality bulletin boards, too. There's only so much room in *Portable 100*, though. These, and the list in *Computer Shopper* should get you started. The format of your *ADRS.DO* entry is shown in your manual:

TAMPA CIS:228-7294<=^C?U7 nnnn,nnn^M?PANTIQUE&FOSSIL ^M?!G PCS154^M> (Note: The last part of this log-on will take you directly to the CompuServe Model 100 Forum)

PORTABLE BBS:1-603-924-9770<?? BILL^M??BRANDON^M??Y?:password^M>

The symbols in the entry are explained in your manual, so I won't repeat the translations here. Just be sure you remember the colon (:) and the angle brackets (<>) around the log-on string.

You may need to make some changes based on where you are when you make the call. For example, if you're calling from a hotel room or an office where you have to dial *9* for an outside line, the number would be entered as *9228-7294*. You might also want to put a couple of delays (= signs) into the string between the *9* and the phone number, to make sure you have a dial tone before the Model 100 begins pulse dialing. (Example: *9=1-603-924-9770* will pause for about two seconds after pulse dialing the first *9*, to allow the phone system to hook you up to an outside line, before dialing the rest of the number.)

Please note that the first time you log onto any service or bulletin board, you will need to do it manually. Either use the *F2* key to capture all the prompts and responses, or take notes, so that you can develop your auto log-on string. Every bulletin board is different. You should also realize that on many boards, you will not be able to upload/download files or read/leave messages until the system operator (sysop) has personally phoned you to verify your registration. Of the boards listed above, only Marc Nowell's has this restriction. The others are open to all comers at any time.

SETTING YOUR *TELCOM* PARAMETERS

For most bulletin boards, you need to set your *TELCOM* status for *8* bits, *No* parity, and *1* stop bit. That is, *8N1*. You may also want to *E*nable XON/XOFF "handshaking," making the status *8N1E*.

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If your telephone system can handle fast pulse dialing, make the last part of your status *20 pps*. To set these parameters, all you need do is enter *TELCOM*, press *F3* (or type *STAT*), type *8N1E,20pps* and press *ENTER*.

Incidentally, you should expect to have to do a certain amount of trial and error to get settings right at first. Remember that in last month's article there was a sidebar with a troubleshooting guide. Keep it handy until you get the hang of things.

DEALING WITH CALL WAITING

If you have call waiting on your line, you will need to disable it. Call waiting functions by temporarily breaking your connection, which the Model 100's modem will interpret as a total loss of connection. The effect is that you get dumped off the phone line without warning. Call waiting can sometimes be disabled for the duration of the current phone call by pressing the * key and then *70*, followed by the number you are dialing. In these cases, you may not be able to autodial using the Model 100. You may need to call your local phone company to determine whether *70 (or another code) will turn off call waiting.

DIALING THE NUMBER

With the direct-connect modem cable, you can use the Model 100's autodial and autolog-on features to make your connection UNLESS you are using a phone service that *requires* tone dialing (for example, you must make an out-of-state call using MCI to get the BBS you are calling). The Model 100 cannot tone dial.

With the acoustic modem cups, you will have to dial and log onto your on-line service or bulletin board manually. When you have completed all the steps above, enter *TELCOM*. Pick up the telephone handset and dial the number of the service. When you hear the host computer's high-pitched modem tone, insert the phone handset into the cups. Be sure you have the mouthpiece and earpiece mated to their proper respective cups! When you hear a new, different tone (this is your computer's tone), press *F4* (*Term*) and proceed to log on.

You need to work quickly, and you may have to try more than once to get a good connection. If you see occasional random graphics characters on your screen while you are using the cups, you probably need to push the handset a bit further into the cups. This may also break the connection. It is good to be patient when using acoustic cups.

If you are able to use the direct-connect cable, autodial and autolog-on, just enter *TELCOM* and use the *Find* function (*F1*) to locate your number. When your computer presents you with the number you have asked for, press *F2* (*Call*). For example, you could press the following sequence to connect to CompuServe in Tampa (assuming you had made the entry shown before in your *ADRS.DO* file): *F1 CIS ENTER F2*. The Model 100 will find the number, dial it, and log on for you. After that, you make your own entries.

If you have call waiting on your line, you will need to disable it.

If you are unable to autodial because you are using a tone-only service to call long distance, or because you had to disable call waiting, follow these directions:

With the computer on and in *TELCOM*, pick up the telephone handset and use the telephone's keypad to call the number you want to reach. When the modem answers on the other end of the line, you will hear a continuous tone. Immediately press the *F4* key on your computer. Wait until you hear a new, different tone, then hang up the telephone handset.

You now type in the information needed to log onto the other system; you can't autolog-on unless you autodialed, unfortunately. Some BBS's require you to press *ENTER* several times to initiate the log-on sequence. CompuServe requires that you enter a control-c (press *CTRL-C*) for this purpose. There are all kinds of schemes out there, as individual as the system operators who provide these services.

IN LIKE FLYNN

OK, you're on-line! Look around, get used to things, experiment. If you're having problems, check the sidebar in last month's column. Try to leave messages, to upload and download. At least leave a message to the sysop to say, "Thanks for being here." The more you fool around, the better you'll get at BBS'ing. In other words, the best way to learn is by doing, not by lurking in the shadows.

Next month, I'll show you how to upload and download messages and files, how to echo information to your printer, and how to save money with CompuServe and long distance bulletin boards.

Valeas, qui legis quod scripsi!

by Bill Brandon

You can contact Bill Brandon through the Portable BBS, *CompuServe (User ID 71316,516), or by mail at 534 Via Corona, Mesquite TX 75150.*

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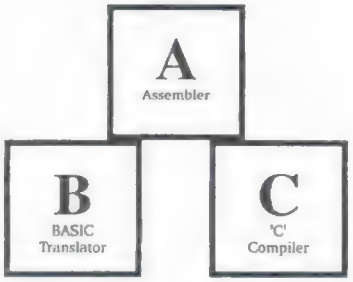

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1985

January: DG has the One to Go, *Model 100 Proves Itself in the Jungles of Nicaragua*, Meet the Dulmont Magnum, *Telecommuter: Software that's Ingenious, Kyocera's Three Aces. End Telephone Tag with M100's.*

February: NEC Wishing upon Its Starlet, In-Depth Reviews of HP 110, Sharp PC-5000, *Chattanooga Systems AutoPen, AutoPad, Trip.*

March: Reviews of Epson Geneva and Osborne 3, Comparisons of Two Thermal Printers (Brother HR-5 and Printex TH-160); *The Pluses and Minuses of Batteries, M100 Data Acquisition.*

April: Reviews of Sord IS-11, Sharp PC-1350, *DISK+, T-BASE*, and Roadrunner; *Free Software: Textpro*, Technology Transfer Damming the PICO Pipeline to Russia.

May: Review of DG1, Which Spreadsheet Should you Buy? Servicing Picos, LCD Screens in Color, Federal Express.

June: Reviews of *Tandy 200, 2.2 Companion*, and *T-Backup, M100 File Transfer*; Wrangler improves the Odds with Sharp PC-5000s, Dow Jones News/Retrieval On-line Database, *Courtroom M100's.*

August: Reviews of Datavue 25 and *Touchbase Modem*; QuickTrip Convenience Stores More Efficient, Tracing Tribal Roots and Translating the Bible in Jungles of Papua New Guinea.

September: Reviews of HP Portable Plus, *WriteROM, ThinWrite 80 Portable Printer*; A Flat Mac, *M100 Meets Challenges at Woods Hole Oceanographic Institute.*

October: Reviews of Kaypro 2000, *T-View 80*; Computerized Fire Department, Stretching the limits of Telephone and Computer, *BASIC translation Tactics.*

November: Reviews of Bondwell 2, NEC 8027A Printer, CQ Haste; *PICO Formatter*, Search and Rescue Via Computers, Industry Views from an HP Exec.

December: Close Look at Ericsson Portable and *TMPC (time management software)*, Travel Tips, Tricks for Traveling, *Dialer Program, Project management with the M100.*

1986

January: Reviews of Gridcase 2, Access, WordFinder, and Prospecting, CP/M and MS-DOS, *Security Program*, Can Universities Cope with Picos? News from Comdex, *Jazz up your LCD.*

February: Reviews of ZP-150, and LeScript Word Processing; *Stevie Wonder Inspires Stardom in M100*, Can Universities Meet Expectations of Computer-literate Students? *Cold-Start recovery, Personalized Form Letters.*

March: Reviews of Panasonic Exec.Partner, Lync 5.0, and *Hardwire*; University Rethinks its Tasks, Picos in Medicine, *Auxiliary Battery Packs Spell Independence, More Muscle for the M100.*

May: Reviews of Toshiba T1100, IBM PC Convertible, Casion FX-7000G Calculator, SG-10 Printer; *MIKEY, Appointment Manager*, and *FAST*, IRS Crowns Zenith';s Z-171, Handhelds in Restaurants.

June: Reviews of Zenith Z-171, *LapCoder, SuperROM, LAPDOS, and BlackJack*; Go Shopping at PC in Rochester, NY, OM10 RAM Map (pt 1), A Tale of Two City Councils.

July: Reviews of Bondwell, ROM2, Letterjet HS-80, and Sidestar,; Electronic Cottage, Taking Stock of Investment databases II, NEC 8201A's LCD, OM10 RAM Map (pt 2)..

August: NH's Governor discusses Laptops, PC-7000 from Sharp, Choosing your test-oriented Database manager, *Model 100/200's Lend a hand to Job Seekers*, NEC-8201A's Communication Connection.

October: Reviews of Toshiba 1100+, New Word, *Diconix Printers*, Fortune 500 Picos, Interview with DG Exec's, Desktop publishing with Picos.

November: Picos in Libraries, *Clever M100 Combinations, Exploring TPDD Part I*, Reviews of Datacomputer 2.0, *TPDD, TS-DOS.*

December: Pcios on Wall Street, Connecting to On-line Databases, Telephone Problems, *TPDD Part II*, Reviews of *Cleuseau, French/German Tutor 3, Pocketsize Modems*; 1986 Article Index.

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January: Book Publishing With a Pico, *Framework in a Pico*, Review of Right-Writer, JK Lasser's Money Manager, HP+Enhanced, Electric Webster, *Disk Power*, Pico's Computer Buyer Guide.

February: *Poor Man's Idea Processor*, Macintosh-Pico Connection, *M100 Cursor key alteration*, Handhelds: HP-18C, Langenscheidt 8000, TI-74, Reviews of Sord IS11-C, *Lets Play Monopoly, $100 letter quality printer.*

April: Browsing the Boards, Writers & Portables, KTI products, Badminton & NEC, Reviews of *Inside the M100, TTXPress Printer, PCSG Business Analyst*, Datapad 84 Zoomracks & ECFS.

May: Doctors with Portables, *Text to printer*, Hitting the Boar[OUT] of PC Convertible Add-ons, Holiday Best, Twist & Shout, *M100 memory Expansion.*

June: Lawyers & Laptops, *Personal Management System, M100./Mainframe Terminal Prog.*, Reviews of Wang Portable, *Search, Sprint and Supercalculator, Best of Compuserve book*, Chess-to-go.

July: Programming in the Portable Environment, Sysop intervierw, Talking portables (pt1), Portable Computer Buyer Guide, Reviews of *TS-Random*, Software Carosel, Popcorn & the Hyperion.

August: NEC 8201 takeon, Laptops in Movie filming, Talking Por[OUT] Reviews of Casio FX-8000G, Tandy 1400 LT, and *System 100.*

September: *English Teachers use Laptops, Picos in Class, Docu[OUT]tes, Picos in the Oil Patch*, Reviews of HP ColorPro, and the *Sportster 1200 modem.*

November: *Control That Printer, Academia & Laptops*, Laptops on Capital Hill, Starlet Secrets, Reviews of Psion II, *DVORAK keyboard*, & Spark.

December: Global Laptopping, Starlet Software, Toronto Blue Jays & GRiD, *NiCd Notes*, Review of IMC LCD-286, 1987 Article Index.

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January: Portable Computer Cellular Communication, Laptop Roundtable, Pico Portable Guide. Reviews Telemagic, Direc-Tree Plus, SchwabLine, Quotrek.

February: TenniStat, Flexibility of Form, T200 and T16. Reviews Eclipse, T1100 Hard Drive.

May: Handhelds Fight Crime, A Pico in China, Compaq Port. III, Datavue Snap, Fax hits the Road, HP Portable Vectra, T1400LT, Three Pocket Modems, Close-Up's Customer & Support.

June: Multispeed in the Tropics, *Monitoring Alkaline Batteries*, PSION and Mass Storage, Datavue Spark, Smith Corona Portable Word Processor.

July: Toshiba on the Road, *Diskette Ratings, Metered NiCd Manager*, Procomm on the NEC, WordPerfect 4.2 on the T1000, Sales Ally.

September: Laptops & the Learning Disabled, WordPerfect 5.0, Dynamac EL, HP-71B, WordPerfect Executive, Webster's New World Writer II.

October: Portables at Sea, Macintosh Navigating, Piloting and Celestial Progs, NEC-8300, Compaq Port. 386, File Transfer, Golden Parachute.

November: European EMAIL, New Tricks for your Casette Recorder, Pico Pillows, Amstrad PPC-640, Selecting the President, Sales Power, Sales Strategy, Office Writer goes Light.

December: FASTECH, Automating Your Sales Force, AI, ScriptWriter, LiteDrive, Homeword Plus, VP-Expert.